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The Birmingham Conference

The 43rd annual meeting of the Institute of British Foundrymen, which was held in Birmingham last week, was a triumph of organisation. It should be remembered that, all throughout the war, there was general agreement that the first peacetime conference should be held in Birmingham, and a firm decision was taken in London a year ago. At that time it was confidently expected that food restrictions would be eased and austerity relaxed. Though the reverse conditions supervened, a brilliant organisation somehow managed to find accommodation for the 650 visitors, and cater for 425 at the annual banquet. Moreover, there was an extensive social and technical programme, including two very large communal luncheons, two dances, 11 works visits, and a well planned series of sightseeing tours for the ladies.

The technical Papers presented were of a good average standard, without quite reaching the best of recent years, but this is characteristic of current technological work at the moment, both here and abroad. There was one exception, and that was Sir Claude Gibb's " Edward Williams Lecture " on " Weldings and Castings." We recently read a confidential report on German wartime tank production and we can only give thanks that the enemy did not dispose of designers of the calibre of Sir Claude, for the report showed the Germans fell into the very traps which, by the prevision such as has been shown by the lecturer, could have been avoided.

The new President, Mr. D. Howard Wood, has been prominent in Institute affairs for about a quarter of a century, and his election emphasises that for progress there must be co-operation between the plant manufacturers and the foundry. Mr. Wood has done much to give to the plant makers an *esprit* of co-operation for the benefit of the foundry industry and not for any of the narrow motives often—though usually quite wrongly—ascribed to employers' associations. Departing from established practice the President is presenting prizes for ideas; however, we expect the moderating committee will limit flights of fancy, and practical application will have its place, whilst still retaining the essential novelty of ideas. One of the best remarks heard during the meeting was the retiring President's *obiter dictum*. Mr. Gardom on relinquishing office advised members " to take care of the man, and the machine would take care of itself." The immediate future of the Institute is well assured by the election of Mr. P. H. Wilson, O.B.E., and Mr. R. B. Templeton, as Vice-Presidents. Both these gentlemen by dint of their personality and enterprise have established themselves as leaders of thought within the industry; the former in the fields of centrifugal pipe and steel bomb production, and the latter, high-duty cast-iron crankshaft manufacture.

As our readers will know, it is difficult to entertain a friend at home nowadays. This difficulty extends to works, hotels and municipalities, and not only the visitors to Birmingham but the whole of the membership of the Institute owes its most profound thanks to the permanent staff of the Institute, the various local committees, the foundry owners and those who collaborated, for what must have been herculean efforts to ensure success. The whole affair was a great gamble, but it was not luck but grit which achieved success. Are the resources of other provincial cities sufficiently elastic to stage similar large scale functions during the next few years? It should be borne in mind that the 43rd Conference was probably the largest metallurgical gathering ever held in the provinces.

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CORRESPONDENCE

[We accept no responsibility for the statements made or the opinions expressed by our correspondents.]

To the Editor of THE FOUNDRY TRADE JOURNAL.

HYDROGEN IN CAST IRON

SIR,—Mr. R. C. Tucker's article, "Hydrogen in Cast Iron," is interesting mainly because of the extreme scarcity of any published views on work where the actual quantity of gas has been measured. The work reported in this article appears to be restricted to the remedying of a gas defect in centrifugal liners cast in metal moulds, but the analysis of the metal is not stated. Was it acid-resisting iron? From reading this article it appears that some of the writer's conclusions are to some extent substantiated, *i.e.*, that dissolved gases in cast iron mainly come from hydrogen, and that this hydrogen is introduced by moisture, *e.g.*, wet ladle, wet lining, sand bottom, etc., provided these are below the level of the liquid. There is evidence in carefully constructed research that moisture in the air contributed its quota in addition, although other factors may exert more influence, *i.e.*, moisture in a wet lining may offset dry atmosphere.

Mr. Tucker now adds to this list moisture in coke as a major, and indeed outstanding, cause of hydrogen, Incidentally, can the exact percentage of moisture in a large quantity of coke be determined by small powdered samples? The writer finds the above conclusion regarding moisture in coke difficult to accept. Without doubting that the defects occurred from the metal melted on the days on which the coke had over 2 per cent. moisture, as Mr. Tucker records, the data given are not conclusive proof.

From some experiments made on pieces of coke, a very porous low-quality piece of Durham patent-oven coke saturated by sinking in water and then set to dry at 200 deg. C., reached 2 per cent. moisture in 70 mins. On the other hand, a piece of good representative quality, Durham beehive coke, by this treatment only absorbed 4 per cent. moisture and reached 2 per cent. moisture in less than 3 mins.

The writer is of the opinion that under cupola conditions all moisture in normal quality coke would be lost before the coke had gone down the stack 12 in. Moreover, it seems strange that moisture blown abruptly into the incandescent reaction zone should take no effect, while moisture in coke which does not get to the combustion zone at all should have such a definite and obvious effect. As the I.B.F. Committee has already considered the subject of gases, and the Joint B.C.I.R.A. and I.B.F. Committee is about to meet, the details of procedure are important and Mr. Tucker's choice of apparatus is interesting.

The writer in 1938-39 had to devise his own apparatus, and it is to be expected that this is capable of improvement by subsequent workers in this field. A bell was designed so as to cover a large area of metal surface, and as the gas comes off through the surface a much larger volume would be got from a 4-in. dia. area than from a ½-in. dia. area. Mr. Tucker found the 4-in. area inadequate and adopted the ½-in. area tube Hatfield and Newell.

It is true that using a bell the quantity of metal from which the gas is collected is uncertain as the question of depth comes in. Only by making the bell cover the whole surface and forming an efficient seal with the sides of the ladle, could it be said that the gas came from the metal used, *i.e.*, a definite volume per unit weight. The writer is familiar with large-scale attempts to do this in steel ingots, but the jointing became defective after one application. The apparatus described in this article, being on the same principle, is no more definite in its measurement of volume per unit weight.

The writer's method was to avoid taking volume and analysis samples at the same time. In volume measurement the air in the tube need not be let off (but always was). In taking analysis samples, the volume of the tube and bell was always allowed for, and this amount taken off before switching to the sampling tube. This can also be done by passing the gas air mixture to waste until it would ignite and burn steadily. Then the gas was switched for sampling. Both volume and analysis samples were always taken under slight pressure, so that there would be no contamination by leakage of air.

The large number of samples taken usually showed no oxygen or only about 1 per cent. Mr. Tucker's analysis given by his tests show from equal quantities to twice as much oxygen as hydrogen. Moreover, it is difficult to see how free oxygen and hydrogen can exist in a confined space over metal at 1,200 deg. C. The simplest explanation is that the oxygen has got in at some later stage.

There does not seem any advantage in being able to machine a test-piece for vacuum fusion out of the resultant plug in the tube, because a solid casting can no longer be in danger of gas hole defects. The technique of gas sampling is difficult, and contributions to the subject are very welcome, but the writer cannot see anything to recommend the substitution of the small "bell," which, by its described mode of application, would be more liable to "leaks" and "absurd results" in the writer's opinion.

Yours, etc.,

WM. Y. BUCHANAN
(foundry manager).

J. Lang & Sons, Limited,
Johnstone.
June 13, 1946.

NEW CATALOGUE

Trucks. A leaflet received from Eccles (Birmingham), Limited, Stirchley, Birmingham, illustrates and describes 16 types of trucks upon which the company has standardised. Of all steel construction, there are amongst the designs listed a number of distinct interest to foundry executives.

I.B.F. ANNUAL CONFERENCE IN BIRMINGHAM

THE 43rd ANNUAL GENERAL MEETING OF THE INSTITUTE OF BRITISH FOUNDRYMEN HELD ON JUNE 19, AT THE GRAND HOTEL, BIRMINGHAM

Mr. John W. Gardom, the retiring President, occupied the chair.

The first business was the presentation of the annual report of the Council for the year 1945-46, which is printed on page 211 of this issue.

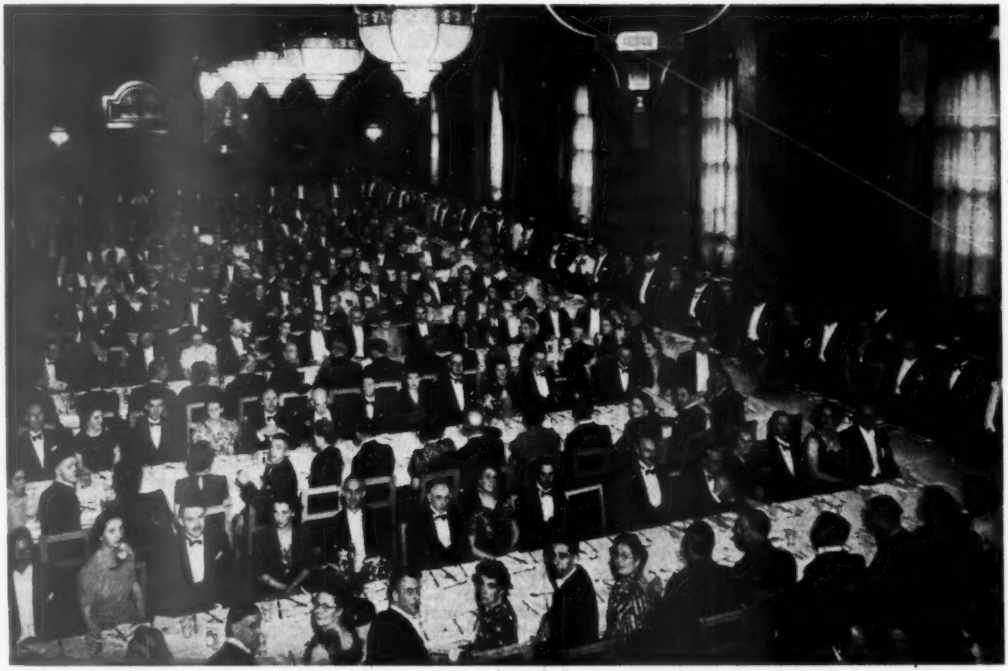
THE CHAIRMAN, presenting the report, commented on the changes in the subscription rates which had become effective during the past year and paid special tribute to Mr. C. W. Bigg (hon. treasurer and past-President) and the Finance Committee for their careful control of the income and expenditure of the Institute.

It was with very great regret that the Council had to report the death of 35 members during the year, amongst them being Mr. J. Hepworth, J.P., M.P., Mr. W. B. Lake, J.P., Mr. R. O. Patterson and Mr. H. Winterton (past-Presidents). Since the close of the official year, Mr. Wesley Lambert, C.B.E. (past-President of the Institute and of the London branch) had also died. The Institute had lost some very valuable members and wise counsel by the passing of those gentlemen.

The total membership of the Institute at April 30, 1946, was 3,569, which compared with the total of 3,366 at the corresponding date in 1945, an increase of 203, equivalent to 16 per cent.

The Council was gratified to be able to report a number of honours and distinctions conferred upon members during the year; particularly, he mentioned the award of the M.B.E. to the Institute's Secretary, Mr. Makemson, for his war-time work at the Iron & Steel Control, Ministry of Supply.

Despite all the difficulties of the war-time period,



THE ANNUAL BANQUET OF THE INSTITUTE OF BRITISH FOUNDRYMEN, HELD AT THE GRAND HOTEL, BIRMINGHAM.

I.B.F. Annual Conference in Birmingham

the branches had hardly reduced their activities. During the past year they had offered their members even more varied programmes, which in many cases had included visits and some social functions.

New Reports Issued

The Institute owed a considerable debt to the branch presidents and officers, and particularly the branch secretaries, for the enthusiasm and hard work which they had put into their duties. The members offered them their very best thanks.

Two outstanding publications during the year had been the first report of the Joint Committee on Sand Testing, entitled "Methods of Testing Prepared Foundry Sands"; and "Lectures in Foundry Practice," prepared by members of the Education Committee, edited by the Secretary, and published for limited circulation to technical colleges and teachers. There was no doubt that the work had been greatly appreciated in educational circles. A further similar publication covering the City & Guilds Final Examination syllabus was in course of preparation.

One of the most outstanding events of the year in connection with educational matters was the gift of £50,000 by the Mond Nickel Company, Limited, through its chairman and managing director, Sir William Griffiths, to provide Fellowships in Metallurgy. It could be expected that further particulars of the scheme would be announced in the next few months; it would be administered by a sub-committee of the Joint Committee on Metallurgical Education.

It was pleasing to report that cordial relations continued between the Institute and a number of kindred societies and institutions; it was most gratifying that a small delegation had been able to attend the 50th annual convention of the American Foundrymen's Association in Cleveland last month.

The chairman moved the adoption of the report.

The resolution was seconded by Dr. J. E. Hurst, J.P. (past-President), and the report was adopted.

Finance

MR. C. W. BIGG (hon treasurer and past-President), proposing the adoption of the accounts for the year ended December 31, 1945, and the balance sheet as at that date, drew attention to the re-arrangement of the assets side of the balance sheet, whereby the items relating to medals were made rather distinct from the general items. Commenting on the balance of £5,372 in the Accumulated Fund, he said that could be considered as satisfactory, but suggested it was not such as to justify the view that it represented the beginning of opulence. The Institute had been in existence for 42 years; so that it had taken a long time to accumulate that balance.

Coming to the income and expenditure account, he said the surplus of income in 1945 was £89 17s. 2d., which compared with £348 in the previous year. There had been an increased income in 1945, but a much greater increase of expenditure. He hoped that situation would be altered next year, when the accounts would show the effect of the increase of subscriptions.

The amount of £459, representing subscriptions paid in advance, indicated the confidence of the members, in spite of the increased subscription rates. The general attitude of the members, as indicated by the figure and by the increase of membership was a tribute, not only to their own loyalty, but also to the initiative and good judgment of the Council in initiating policy.

MR. DAN SHARPE (past-President), seconding, conveyed to Mr. Bigg the confidence of the members in his handling of the finances.

The accounts were adopted.

Technical Council's Report

MR. P. A. RUSSELL (chairman of the Technical Council), moving the adoption of the Technical Council's 14th annual report, commented with satisfaction on the fact that the Council had submitted technical reports to the Conference, and referred particularly to the report on control tests for grey cast iron as being of major importance to the industry. Some of the supplementary work was not of a type which was reportable to members as a whole.

The work in connection with malleable cast iron specifications had reached the stage of making representations to the British Standards Institution, and the report on grey cast iron specifications would also be reported shortly to the B.S.I. The Council had also to look after various other technical interests of the Institute, as shown by the report.

DR. A. B. EVEREST (past-president, London branch), seconding, paid tribute to Mr. Russell, whose colleagues were very sorry that he was resigning the chairmanship of the Technical Council. He had led the council for the past two or three years with outstanding success, and the quality of the work of the council was largely due to his personal influence and interest. The members of the Council wished his successor every success.

The report was adopted.

Oliver Stubbs Medal

The Oliver Stubbs Gold Medal for 1946 was awarded to Mr. A. Phillips (Superintendent of Foundries and Pattern Shop, Metropolitan Vickers, Limited, Manchester). In presenting the Medal, the chairman said that, by making the award to Mr. Phillips, the Council had recognised the high value of his services to the Institute and the industry since he was elected to membership in 1922. He had read a number of papers before various branches of the Institute and had been awarded diplomas on three occasions.

For several years prior to 1930 he had conducted much of the experimental work upon which the Test-Bar Sub-committee of the Institute had based its recommendations to the British Standards Institution, which had led to the publication of the first British Standard Specification for Grey Iron Castings.

Since that time Mr. Phillips had been almost continuously a member of the Technical Council, and on several occasions a most active and valued member of various of its sub-committees. He was at present

chairman of one of the sub-committees dealing with light alloy test-bar procedure. He was also a member of the sub-committee investigating the stress relief annealing of iron castings.

In addition, he had taken a most active part in the affairs of the Lancashire branch, of which he was a past-president, and the high value of his contributions to the discussion of papers read before that branch would be greatly appreciated, particularly by those who had presented papers there.

MR. PHILLIPS, in his response, commented on the difficulty of the problem of deciding to whom the honour should be awarded, because there were many members of the Technical Council and in the Institute generally who were giving their services ungrudgingly and unstintingly to help the Institute to maintain the position it held today. He paid tribute to them, and hoped that he would be able to help the work of the Institute in the future.

E. J. Fox Gold Medal

The E. J. Fox Gold Medal for 1946 was awarded to Sir Lawrence Bragg, F.R.S., Professor of Physics at Cambridge University and Head of the Cavendish Laboratory.

MR. E. J. FOX, who made the presentation, said that to Sir Lawrence and his late father, Sir William Bragg, was attributed the discovery and the development of the application of X-ray diffraction methods to the determination of atomic structures of solids. The application of those methods to the determination of the atomic structures of metals and alloys by Sir Lawrence had had a profound influence in extending the knowledge and understanding of their qualities and properties. Metallurgists in general, and foundry metallurgists in particular, dealing as they did with a vast range of metals and alloys, including cast iron, steels and non-ferrous metals, recognised that.

In making the recommendation the assessors had felt that the Institute would like to take advantage of the opportunity they had in the E. J. Fox Medal of recognising outstanding developments in fundamental theoretical metallurgy. Past awards had attempted to recognise developments in the metallurgy of cast iron, steel, non-ferrous and light alloys, foundry engineering and foundry industrial organisation; and in making the award to fundamental theoretical metallurgy the assessors were carrying out the policy envisaged by the trustees.

SIR LAWRENCE BRAGG said it was extraordinarily pleasing to receive such an award in a subject which was not one's own; he did not think that by any stretch of the imagination he could be called a foundryman. He had tried to think of any qualification he had for so high a distinction, and all that he could recall was that in his youth he had moulded the keels for the toy yachts which he had made at that time.

Expressing his great pride in the great honour bestowed on him, Sir Lawrence said that as a physicist he had been very interested in the way in which matter was built up. During the last generation, physicists had been very much concerned with the way in which the insides of atoms were made up, and they had been accused by their industrial friends of being rather too much concerned with the insides and not quite enough with the outsides. He had done what he could to retrieve the balance by seeing what happened when atoms were stuck together. The work had been fascinating, and he had met so many others who were concerned with many lines of work. He was proud to be honoured by the award of the Medal, which he accepted as recognition of the fundamental research which was done in the universities, to which Mr. Fox had so kindly referred.

To illustrate that the work in the universities had its value, Sir Lawrence recalled that when he was at Manchester he had often discussed with others the work which they were doing. There were two young physiologists who had said that they were working on the super-renal glands, which they had described as "glands which, if cut out, you die of!" They had discovered that people died from super-renal deficiency. Sir Lawrence said he took the view that the Institute of British Foundrymen, in awarding him the E. J. Fox Medal, was recognising that some of the work in the universities, though it might seem queer and unconnected with practice, did play an important part in the industrial body, as did the ductless glands in the human body. He hoped the award was made in that spirit, and that the contact between industry and the universities would flourish.

British Foundry Medal

This Medal was awarded to Mr. S. L. Fry (metallurgist, Kent Alloys, Limited, Strood, Kent), in recognition of his excellent Paper, "Preliminary Investigation of Metal Pouring by Ciné Radiography," which was presented to the annual meeting of the Institute in 1945.

MR. V. C. FAULKNER, who made the presentation on behalf of the donor, Mr. Barrington Hooper, C.BE., said that Mr. Fry had been doing some brilliant work, probably as a direct consequence of Sir Lawrence Bragg's fundamental investigations. The Paper described a method he had developed for investigating what occurred inside a mould when metal was being poured into it. That was a problem which foundrymen had always sought to solve.

After many months of experiment, Mr. Fry had devised a satisfactory apparatus embodying X-rays and had satisfactorily photographed streams of metal entering mould cavities; some typical examples were given in his Paper. From its title one hoped and expected that he would make further contributions to the Institute as his investigations proceeded, for, to quote his own words, "although the present results have been of use and have shown what has often been surmised, the full possibilities of the technique are not even indicated. In the foundry alone it should help to raise the casting process to a much more exact science, whilst in testing and general applications there does not appear to be any limit to its ultimate use."

Mr. Faulkner concluded by drawing the attention, of the younger members particularly to Napoleon's remark that "luck is the superstition of the incompetent." He emphasised that there was no luck in arriving at a method such as that described in Mr. Fry's Paper; it meant a lot of hard work and deep thinking.

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MR. FRY, expressing his deep appreciation of the award, said that all he could do was to earn it. There was much further work to be done, and he hoped to present the results of it in the future.

Diplomas

It was announced that the Council of the Institute had awarded diplomas to the following for papers presented to the branches during the past session:—

MR. N. C. BLYTHE, for a Paper on "Sand Supply to Moulding Machines from Overhead Hoppers." (Birmingham branch.)

MR. R. H. BROWN. "Duplex Pump Castings." (Bristol branch.)

MR. D. H. YOUNG. "Cupola Operation." (Scottish branch.)

MR. A. B. BILL and MR. J. PEERS. Joint Paper on "Mass Production of Tank Wheels in Blackheart Malleable." (East Midlands branch.)

MR. T. COOK. "Inspection in a Mechanised Foundry." (Scottish branch.)

Election of Officers

The following officers were unanimously elected for the year 1946-47:—

President, Mr. D. Howard Wood.

Senior vice-President, Mr. P. H. Wilson, O.B.E.

Junior vice-President, Mr. R. B. Templeton.

The privilege and pleasure of proposing the election of Mr. Wood as President was claimed by MR. GARDOM, the retiring President, who said the Council was unanimous in their nomination of Mr. Wood. The resolution was seconded by MR. F. J. COOK (past-President), and carried unanimously.

THE PRESIDENT said he was deeply conscious of the honour conferred upon him, and was not unaware of the responsibilities which the office entailed. In 1939, when he was elected junior vice-President, the membership of the Institute was approximately 2,300, and today it was more than 3,600; so that the responsibilities had increased by more than 50 per cent. Even during the past two years, under the leadership of Mr. Gardom, the membership had increased by more than 600.

Expressing his gratification in the unanimity of his election, he said he could not do better than to adopt the motto of the ancient Princes of Wales, "Ich Dien"—I serve.

DR. J. E. HURST, J.P. (past-President), who proposed Mr. Wilson's election as senior vice-President, said there were innumerable reasons why he was a fit and proper person to occupy the position. The first, of course, was that he had served as junior vice-President for a year. Another reason was that he was chairman of the council of the British Cast Iron Research Association; the members of the Institute were glad that in the ranks of their upper hierarchy they had a man connected so closely with that organisation. A further reason was that he was an E. J. Fox Medallist, the Medal having been awarded to him some years ago for his foundry work in general, more particularly for his stupendous work in the development of the centrifugal casting process as applied to the production of cast-iron pipes. Still another reason was that he was connected with that great foundry organisation, the Stanton Ironworks, which had always taken a deep interest in the affairs of the Institute, of which he had always been a loyal and staunch supporter. Perhaps the best reason for taking great pleasure in his election was that he was himself a foundryman and an acknowledged leader among foundrymen.

MR. WALTER WEST, seconding, said that Mr. Wilson's work during the war particularly had been so outstanding that members everywhere would know that the interests of the Institute for the future would be perfectly safe in his hands.

MR. WILSON, responding, said he did not think he deserved all the very nice remarks which had been made; but it was very evident, though he had not realised it himself, that he was fully qualified for the position!

Commenting on the reference to his experience, with Mr. Fox, of the development of centrifugal casting, he said he was not sure whether a civil servant would be eligible for the Presidency or vice-Presidency of the Institute. From what one read in the newspapers, the powers-that-be proposed to take certain action in regard to the great iron and steel industry, apparently being satisfied that the foundry industry, except the spun pipe industry, was quite capable of taking care of itself. Whether they had concluded that that particular section of the industry was so badly managed that it was time they took it over, he did not know. On the other hand, they might regard it as the only section of the industry worth considering!

MR. J. CAMERON, SENR. (past-President) took pleasure in proposing the election of Mr. Templeton as junior vice-President; Mr. Templeton had served as president of the London branch, he had proved himself a very able and enterprising foundryman, and he had made a speciality of the very difficult job of producing cast-iron crankshafts. Having been very closely associated with Mr. Templeton during the past 10 years, Mr. Cameron said that his appreciation of and affection for him had grown. He was an able and fluent speaker, a good foundryman, a very good friend, and a first-class worker.

MR. FRANK HUDSON seconded. He paid tribute to Mr. Templeton's enthusiastic interest in the Institute's activities, his progressive outlook, his pioneer work in connection with high-duty irons and cast-iron crankshafts, and his work in educational matters in the London area; it was largely due to his activities that there was an enthusiastic class of 26 foundry students at the Borough Polytechnic, London. The choice of Mr. Templeton as junior vice-President could not be bettered, and in the future the members could look forward to his carrying on the important duties of President in a manner worthy of all those who had gone before.

MR. TEMPLETON made a brief response, in which he said he would strive to the utmost to uphold and further the great traditions which his predecessors had established.

Members of Council

The ballot for the election of five members of Council to succeed those who had retired by rotation resulted in the election of the following:—Mr. H. Bunting, Dr. A. B. Everest, Mr. C. Gresty, Mr. A. Phillips, and Mr. J. J. Sheehan.

Alteration of Bye-Laws

The following resolutions were put to the meeting for the adoption of the altered bye-laws of the Institute. Notice of motion had been given in accordance with bye-law 24. The altered bye-laws, having been approved by the General Council, were circulated to all members on May 20, 1946:—

(1) That the bye-laws so altered and added to and as contained in the print laid before the meeting be and the same are hereby adopted as the bye-laws of the Institute in lieu of the present bye-laws such present bye-laws to cease to have effect and the bye-laws so adopted to come into force and effect when and so soon as the approval of the Privy Council to the bye-laws so adopted and the certificate of such approval under the hand of the Clerk of the Privy Council have been obtained.

(2) That the Council be and is hereby authorised to take all necessary steps to obtain the approval of H.M. Privy Council to the newly adopted bye-laws and for such purpose if necessary to seek the granting to the Institute of a Supplementary Charter of Incorporation.

Greetings to Overseas Associations

On the motion of Mr. V. C. Faulkner, seconded by Dr. J. E. Hurst, it was resolved that messages of greetings be forwarded to allied associations in America and Europe.

The Acting Secretary

It was proposed by Mr. E. J. Kelly that the outstanding work of the Institute's Acting Secretary be recognised in a tangible manner. Mr. Gardom gave the assurance, on behalf of the President, that that matter would be dealt with.

Thanks to Retiring President and Council

The PRESIDENT, proposing a hearty vote of thanks to the retiring President, Mr. Gardom, and the other members of the General Council, for their work, paid tribute to Mr. Gardom's tremendous energy and drive, and his assiduous attendance at Council and committee meetings. One could not speak too highly, he said, of Mr. Gardom's work as President, which had entailed long journeys on many occasions under most difficult conditions. He added that, as a small tribute of appreciation, the General Council had decided to alter the name of the Technical Students' Fund to the "John Gardom Students' Fund."

Tribute was paid also to the hon. treasurer (Mr. Bigg) and to the other members of the Council, whose work on behalf of the Institute had entailed a great deal of inconvenience and considerable expense. The fact that the average attendance at Council meetings was 55 out of a possible 80 was proof of the keenness of members of Council for the work of the Institute.

MR. COLIN GRESTY, seconding, said that Mr. Gardom's enthusiasm not only drove, but inspired, his co-workers. In spite of the difficulties due to war conditions, he had succeeded in carrying out all his duties without any delay at all. All the other members of the Council, and the officials of the Institute, had also set a fine example of service.

The vote of thanks was accorded with acclamation.

MR. GARDOM, responding, said that any work for the Institute had been freely given by members of the Council. He expressed his thanks for the great help that had been afforded him during his Presidency by all his colleagues, including the secretaries of the branches and sections, among whom he mentioned particularly Dr. Walters, the hon. secretary of the Lincoln section. As one who was interested in mechanisation and who had recommended non-mechanisation more often than mechanisation, he gave to all concerned with industry the advice, "Take care of the man, and the machine will take care of itself."

Finally, he expressed great appreciation of the services of the Institute's Secretaries and staff.

Greetings

It was announced that greetings had been received from Mr. P. Bastien (president, French Foundrymen's Technical Association); Prof. Píšek (president, Czechoslovakian Foundrymen's Association); Prof. Portevin; and Dr. Spies (president of the Dutch Foundrymen's Association).

Presidential Address

Following the delivery of the Presidential address, printed on page 219 of this issue, MR. P. H. WILSON proposed a hearty vote of thanks to the President, and complimented him particularly on his references to welfare matters. Amenities and foundry conditions generally could be improved, and it was well to bear in mind Mr. Gardom's advice, "Take care of the man, and the machine will take care of itself." Apart from encouraging young men to enter the foundry industry, if the conditions were improved on the lines on which it was possible to improve them, the products of the foundries would be considerably improved. The problem was one which should have the very careful attention of the Institute.

MR. J. J. SHEEHAN, seconding, congratulated Mr. Wood on his appointment, in his native City, to the honour of President of the Institute.

During the address, he said, Mr. Wood had referred to the history of the Institute, of its foundation, its activities, particularly its activities during the war, its present position and its hopes for the future; whilst speaking of the industry, of the Institute and of the activities of the committees, he had been able to link all those regimented bodies with the individual spirits which had animated them. He had had the foresight to see that committees and institutions could have no existence or power except through the outstanding individuals who dignified them by their activities.

When the President had come to discuss the working conditions and amenities in foundries he had had the foresight and grace to refer to the "F. J. Cook Award." That emphasis of the individual was tremendously necessary in these days of planned materialism, and it was an indication that we might still hope to conserve and develop that tradition of the integrity and dignity of

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the individual spirit which we had inherited through our European civilisation.

There were many other individuals whose activities had stimulated every member of the Institute. Mr. Sheehan made special mention of Mr. Tom Makemson, who, by his personality and perhaps his training in the Institute, had made the bureaucracy which he was serving more tolerable and a little more human than they had had reason to expect. The President's address was, perhaps unconsciously, typical of his own generous personality, and it was a great pleasure to voice the thanks of the Institute to Mr. Wood.

The vote of thanks was carried with acclamation.

The PRESIDENT, in his response, expressed his indebtedness to the managing directors of the two foundries which he had cited in connection with labour. Thanks to the facilities they had afforded him, he had learned much. He had spent nearly two days in one foundry and had talked to more than fifty of the trainees. He had found them intelligent, and they were happy. He would be glad to give further information which he had gathered.

ANNUAL BANQUET

A distinguished gathering of members and guests assembled at the Grand Hotel Birmingham, on June 20 for the Institute's annual banquet. They were received by the President, Mr. D. Howard Wood, and Mrs. Wood, and spent an enjoyable evening, which included dancing and a cabaret.

The Toasts

The Loyal Toast having been honoured, THE RT. HON. LORD ILIFFE OF YATTENDON, G.B.E., C.B.E., proposed "The City of Birmingham," with which he coupled the name of the Rt. Worshipful the Lord Mayor of Birmingham, Alderman A. S. Giles, O.B.E., M.C., J.P.

No more appropriate place than Birmingham, he said, could possibly have been chosen for the annual banquet of the Institute of British Foundrymen. Apart from the fact that the President was a Birmingham man, Birmingham could be regarded as the very home of the ironfounding industry. In fact, the industry touched directly upon the origin of Birmingham's industrial life. Roman colonists were probably the first to undertake iron production in England; proofs of their activities had been found in the Midlands, first in the Forest of Dean, then at Worcester and later in the Birmingham district. It was when the Forest of Dean foundries had dropped out that Birmingham had risen again. Birmingham cutlers had supplied Cromwell's army with pikes and swords, and the inhabitants of the town were said to be as industrious as they were skilful; according to one authority, the sounds of the hammer were heard at 3 o'clock in the morning.

Obviously, at that time there was no Institute of British Foundrymen in existence. Among the early founders, as among householders, there was a considerable prejudice against the use of coal, indeed, the old manufacturers had held it to be impossible to reduce ores by any other means than by wood in the form of charcoal. But once the prejudices were overcome, progress was rapid, and men of shrewdness and inventive genius had laid the foundations of the prosperous foundry industry we knew today.

Foundation of British Industry

Birmingham proudly boasted that it was a city of a thousand trades, and it was amazing to realise how many of them depended upon the foundry for their basis. For instance, one of the newest trades, that of plastics, had to start with the requisite moulds. In truth it could be said that British foundries were in themselves the foundation of British industry; and it had long been an axiom in British trade circles that, when business was bad in the foundries, then trade as a whole was in for a lean time.

After pointing to the invaluable contribution Birmingham had made to the country's war effort, Lord Iliffe said that in these days of somewhat uneasy peace the prospects of the industry were no less important. The products of the foundry were as necessary to our housing needs as were bricks and mortar; no dwellings could be complete without cisterns, grates, cookers, and so on. Thus, there lay ahead for the industry a long period of sustained activity in the home market, quite apart from a huge potential export business which awaited development. The industry depended on pig iron, pig iron depended on coal, and apparently coal now depended on the Government! So that Birmingham was vitally interested in the success of the nationalisation of the coal industry, which it was watching with considerable interest and not without some anxiety.

Whatever the future, he felt that our difficulties would in the end be overcome. The citizens had every right to look back with pride on the part which Birmingham had played in helping the glorious victory which was achieved. The courage and valour of the armed forces would have been in vain without the products of the workshops of Birmingham. Of its million people, 400,000 were engaged in the production of munitions—tanks, aeroplanes, radio parts, etc. It was obvious that the great firms whose names were household words had accounted for a very large part of the tremendous production in the Birmingham area during the war.

Birmingham's Great Record

The strength of Birmingham rested on its multitude of small firms, each of which had played its part, particularly in the manufacture of small components. It was hoped that the present trend to nationalisation and amalgamation would leave untouched those little firms which had been such a bulwark in maintaining Birmingham's prosperity, and at the same time a splendid example of good relations between master and man.

Birmingham had a great record in the past, and it was good to know that the civic authorities were plan-

ning wisely for the re-development of the city; the first step towards that was the Birmingham Corporation Bill, which was recently approved by Parliament. All who were interested in the welfare of the city would do all they possibly could to encourage the forward-looking city authorities to make England's second city the finest in the provinces.

THE RIGHT WORSHIPFUL THE LORD MAYOR (Alderman A. S. Giles, O.B.E., J.P.), in his response to the toast, said he had had the advantage of being allowed to visit many representative works in the city; he had been impressed by the fact that so many trades were dependent on metal and that metal was dependent on the foundrymen's art.

Discussing the question of conditions in industry, the Lord Mayor commented on the changing of fashions. Many years ago, when he was an apprentice, he was advised to use his cap in order to black the kitchen stove two weeks before he wore it, and never to wear clean boots at the works. In those days, if one worked hard at a dirty job, one was proud to show the results of one's labours on one's clothes. But nowadays the young people did not like that sort of thing, and their neighbours in the buses and trams were apt to object to dirty clothes. Thus it seemed that one of the problems of the foundry industry was to make itself attractive. Perhaps the British working man might take a hint from his American opposite number. The Lord Mayor said he had noted that when the Americans "knocked off," one could not tell the workmen from the office manager; and when one walked through a factory, however dirty the processes, one found men in overalls, and complete with cap and gloves. It was regarded in England as being rather effeminate to wear gloves; but it was possible to get used to wearing gloves and, judging by the go-getting ideas of our American friends, men could work successfully when wearing gloves.

Tribute to Workmen

After a tribute to the workmen, and to the keenness of the returned servicemen to work, the Lord Mayor said that, by giving a little encouragement, industry would secure all the labour it desired. The prosperity of the city depended on the business that could be brought to it, and that business would be maintained only by the good will of the citizens and the workmen; that applied throughout, from the managing director to the man who fired the furnace. It was up to the authorities of the city to help the business men to make the best of its position in the heart of England.

MR. C. R. WHEELER, C.B.E., proposing "The Institute of British Foundrymen and the Foundry Industry," said that at no time in our history had the good health of that great industry been more important to the community at large, and at no time had the difficulties been greater than now. Few, he believed, were better qualified to speak of the difficulties which beset the foundry industry than he, who in the earlier part of the war was specially concerned with reducing violently the activity of some parts and expanding as rapidly other parts of the industry, whilst at the same time changing the raw material supplies to conform to circumstances which had changed overnight through the early successes of the enemy. Since the end of the war he had had a good understanding of the formidable task which the industry was now tackling in beating swords into ploughshares, or rather, bombs into baths.

Labour Shortage

Its principal trouble today was the shortage of labour in certain foundries. The reason was not a little due to the enforced distortion of the industry during the war. Many sections of the industry were forced by the limitations imposed by war to mark time on envisaged developments for six years. That had had a profound effect upon standard of equipment. When critics were disposed to blame the conditions of working in the industry he frequently felt it fair to point out that gap in what might have been expected to be a development period, and which in America was a period of enormous plant and equipment re-building.

Nevertheless, the industry had an urgent job in attracting and retaining suitable labour. During his post-war experience as Controller of Iron and Steel, that need for labour in the industry was a constant anxiety. Should a post mortem be necessary on him later, the words "foundry labour" would without doubt still be legibly engraved on some suitable part of his anatomy.

The Institute had a great part to play. Without doubt there was a great need for overtaking the lag in works modernisation and improving the standard of equipment and conditions in many branches of the industry, without which the industry would suffer even graver handicap than the limitation of recruitment of suitable labour.

"Epoch of Change"

We were in the middle of the epoch of change in foundry practice, the decline of art and the rise of science. That was indeed work for the Institute. The need for more scientific application was striking, and in that sphere the Institute could do and was doing great work. Much of the benefits of scientific application lay to hand in both the ferrous and non-ferrous branches, which were expanded largely under the influence of war. The Institute was giving the founders who were restricted in their development during the war the opportunity of gaining the experience of those who were driven to innovation.

Some criticism had been hurled at the iron and steel industry on the score that they had been too complaisant, particularly as much of their wartime activity had been in the usual type of production. The founders could not be in that category. No one was left alone. The expansion of production was the order of the day in light alloys, steel and malleable, while most others had radically changed their trade, venturing into new fields or adapting normal practice to the production of unfamiliar articles.

An industry which produced the variety of castings in

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the Merlin engine, the Grand Slam bomb, and the solution of the track link problem had every reason to be satisfied with its war record. The co-operation of the Institute's Technical Committee with the Government was of great value.

The necessary improvements in technique, scientific application and economy of effort gave great scope for the Institute's members. The recent visit of some of them to America would prove fruitful to all; the Americans had made great strides in mechanisation and handling in all operations.

Commenting on the great antiquity of the industry, Mr. Wheeler said that perhaps the first signs of what we called civilisation were the first artificers of metals. The President, Mr. Wood, had great traditions in the iron industry, particularly long for one of his name. Tradition was something we wished to preserve, and it did not by any means conflict with the scientific approach; all sound businesses were based on the judicial mixture of scientific application and a tradition of success and continuity.

Nationalisation Doubts

The controversial subject of nationalisation was much in mind among the branches of the ferrous industry. Among the members of the Institute, judging by the announcements in the House of Commons, there would seem to be few peaches ripe for plucking. One could only hope that the very necessary practical developments would proceed with the minimum of delay and disturbance. Time was vital; much development must be done to catch up after the gap created by the last seven years in our national competitive position.

Referring to a particular debt which he personally owed to the Institute, Mr. Wheeler said the success of the Iron and Steel Control in handling matters pertaining to the ironfoundry industry and in presenting their problems to the appropriate Departments of State had been entirely due to the Institute's public-spirited action in loaning the services of its Secretary, Mr. Makemson. Both His Majesty's Government and Mr. Makemson's associates were very conscious of his worth and of the handsome manner with which, in that period of difficulty, the Institute had continued to make his services available. Having a very full knowledge of the sterling worth of Tom Makemson, Mr. Wheeler congratulated the Institute on its Secretary.

Finally, he expressed enthusiasm for the enormous amount of work and thought which all had to apply to improve efficiency, and said it was indeed a splendid prospect when one contemplated the immense field of effort ahead.

President's Response

The PRESIDENT, responding, thanked Mr. Wheeler for his very fine tribute, and commented on some of his remarks. On the suggestion that he bore the wrong name for one in the foundry industry, he remarked jocularly that the first method of melting metal was by the use of wood fuel in the form of charcoal.

The President took advantage of the opportunity which the occasion afforded him to pay tribute to the work of those responsible for the organisation of the conference. Quite a number of difficulties had had to be met, and it would be agreed that on the whole the Committees had overcome them. (Applause.)

Tribute to Local Efforts

First, in a tribute to the Institute's Acting Secretary, Mr. John Bolton, he recalled that some four months ago the Conference Secretary, Mr. A. A. Timmins, unfortunately had had to undergo a serious operation, and the Executive Committee was in great difficulty. They had asked Mr. Bolton if, in addition to all the work he was then doing, he could possibly organise the Conference. He had done a wonderful piece of work, and tribute should be paid to him and his staff, who had worked night and day. (Applause.)

In connection with such conferences some financial assistance was required; the President expressed thanks to Mr. F. N. Lloyd and Mr. N. C. Blythe, the chairman and convener respectively of the Finance Committee.

The Hospitality Committee had been responsible for arranging all the social functions, and they had had a difficult task. Thanks were due to Mr. G. R. Shotton and his colleagues, Mr. B. Gale and Mr. W. Todd, for their tremendous work. They had had the responsibility of providing the main dishes at the banquet.

The Literature Committee, with Mr. A. J. Shore as chairman and secretary, and Mr. G. M. Callaghan, Mr. A. E. Lester and Mr. H. J. Roe, had done good work.

The ladies' programme, which he had learned was thoroughly enjoyed, was due to the hard work of the Ladies' Committee, with Mrs. T. H. Gameson as chairman and Mrs. J. J. Sheehan as secretary. To those who had searched the highways and byways for hotel accommodation the President also tendered thanks.

Finally, expressing thanks to Mr. Wheeler for his proposal of the toast, he said the Institute was rapidly approaching a membership of 4,000; he assured Mr. Wheeler that it would continue to thrive and to grow, and that its members were proud to be competent in that ancient and honourable art of founding, which had been in existence for more than 5,000 years.

MR. BARRINGTON HOOPER, C.B.E., proposed "The Guests." In the first place he recalled that he was privileged to propose a similar toast on the occasion of the International Foundry Convention in London in 1939, and he voiced the extreme pleasure it afforded the men folk who were attending the conference to be able to entertain their ladies again on such an occasion after a gap of seven years.

On behalf of the Institute it was also a privilege to welcome guests from overseas. Among the guests there were representatives and friends from Holland, France, Sweden, Belgium, Czechoslovakia, Persia, South Africa, India and Australia.

A cordial welcome was also extended to many other distinguished guests whom he mentioned individually—the Lord Mayor and Lady Mayoress of Birmingham; Mr. C. R. Wheeler; Lord Iliffe, to whom Mr. Barrington Hooper offered sincere congratulations on the further distinguished Order he had recently

ANNUAL REPORT OF THE INSTITUTE OF BRITISH FOUNDRYMEN

Including Fourteenth Report of the Technical Committee

This report covers the period May 1, 1945, to April 30, 1946

Finance

At the annual general meeting held in London on June 16, 1945, an alteration in Bye-Law 7 (Subscriptions) was unanimously adopted subject to approval by H.M. Privy Council. The Privy Council allowed this alteration on August 8, 1945, with the result that as from January 1, 1946, the following annual subscription rates apply:—Subscribing firms, £5 5s.; members, £3 3s.; associate members, £2; associates over 21 years of age, 10s.; and associates under 21 years of age, 5s.

The full effects of these alterations will not, of course, be known until the end of the present financial year, but it may be reported here that receipts of subscriptions due for 1946 indicate that members generally support the alterations which have been made. In the 1945 income and expenditure account the increased subscriptions have had the effect of offsetting to some extent the advance in the net subscription income which would otherwise have been shown as a result of the substantial increase in membership, for £4,851 14s., shown for this item has been arrived at after deducting a record total of £459 13s. subscriptions paid in advance as compared with an equivalent deduction of £307 5s. 6d. made in the previous year.

The increased financial resources which are now being made available as a result of the changes in the subscription rates are being carefully controlled by the Council and will be used exclusively to enhance the services which the Institute renders to its members.

Membership

A further substantial increase in membership is shown in Tables I and II, which show that the total membership of the Institute at April 30, 1946, to be 3,569 against 3,366 at the same date late year. Of the losses sustained during the year, the Council regret to announce that thirty-five are due to the deaths of the following members which have been notified during the year:—Major T. G. Bird, D.S.O.; member, Newcastle branch, elected 1919; Mr. T. F. Brindle, member, London branch, who died in December, 1944, when a civilian internee in Japanese hands in Burma, elected 1926; Mr. W. E. Clement, C.B.E., member, Wales and Monmouth branch, elected 1917; Mr. A. Fraser, member, Scottish branch, elected 1936; Mr. J. Hepworth, J.P., M.P., past-President, member, West Riding of Yorkshire branch, elected 1936; Mr. A. R. Hudghton, member, Lancashire branch, elected 1937; Mr. W. B. Lake, J.P., past-President, E. J. Fox Medallist, member, London branch, elected 1922; Mr. A. A. Liardet, the first president of the West Riding of Yorkshire branch, elected 1922; Mr. R. G. Martin, member, London branch, who died in 1942 during the German occupation of Holland where he was resident, elected, 1939; Mr. J. W. Monsey, member, East Midlands branch, elected 1936; Mr. James McArthur, member, Scottish branch, elected 1925; Mr. A. D. G. McBean, member, Birmingham branch, elected 1933; Mr. C. B. Northey, member, London branch, elected 1938; Mr. E. W. Oakes, member, Sheffield branch, elected 1944; Mr. R. O. Patterson, past-President, member, Newcastle branch, elected 1912; Mr. C. W. J. Purnell, member, Wales and Monmouth branch, elected 1937; Mr. R. Scott, member, Scottish branch, elected 1936; Mr. J. A. Smeeton, member, London branch, elected 1928; Mr. J. A. E. Wells, member, Sheffield branch, elected 1914; Mr. H. Winterton, past-President, member, Scottish branch, elected 1906; Mr. R. J Bartholomew, associate member, London branch, elected 1936; Mr. H. Broughton, associate member, Lancashire branch, elected 1925; Mr. H. G. Cochrane, B.Sc., associate member, East Midlands branch, was killed in action at Singapore in 1942, elected 1937; Mr. D. Evans, associate member, Lancashire branch, elected 1944; Mr. G. C. Forrest, associate member, Lancashire branch, elected 1938; Mr. J. Galt, associate member, Scottish branch, was founder member of the Institute having been elected in 1904; Lieut.(E.) E. W. Kennard, R.N.V.R., associate member, London branch. Died on active service, elected 1938; Mr. J. Kerfoot, associate member, East Midlands branch, elected 1934; Mr. H. W. Knight, associate member, London branch, elected 1938; Mr. H. Martin, associate member, East Midlands branch, elected 1945; Mr. W. A. Oakey, associate member, Wales and Monmouth branch, was killed in action in France in July, 1944, elected 1937; Mr. C. Oxley, associate member, Sheffield branch, elected 1914; Mr. H. Prince, associate member, East Midlands branch, elected 1936; Mr. W. Rolland, associate member, Scottish branch, elected 1936; Mr. J. H. Smethurst, associate member, Lancashire branch, elected 1906.

Members' Honours

The Council desire to take this opportunity of congratulating the following members who have been honoured during the past year:—Mr. C. W. Bigg, past-President, was elected president of Derby and Derbyshire Chamber of Commerce; Dr. J. W. Donaldson was elected president of the West of Scotland Iron and Steel Institute; Mr. V. C. Faulkner, past-President, was elected an honorary member of the Czechoslovakian Foundrymen's Association; Mr. J. W. Gaunt was elected honorary president of the Midland Ironfounders'

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Association, which he founded in 1926; Sir Summers Hunter was re-elected president of the North-East Coast Institution of Engineers & Shipbuilders; Dr. J. E. Hurst, past-President, was made Sheriff of the County of the City of Lichfield and was elected a Freeman of the Worshipful Company of Smiths; Sir William J. Larke had conferred upon him by Durham University the honorary degree of Doctor of Science; Mr. F. N. Lloyd was elected president of the Wednesbury and Darlaston Manufacturers' Association; Mr. T. Makemson, Secretary, was awarded the M.B.E.; Mr. D. Cherry Paterson, M.I.Mech.E., was elected president of the Foundry Trades' Equipment and Supplies Association; Dr. W. J. Rees, O.B.E., who was elected president of the British Ceramic Society; Major H. C. Stewart was awarded the Military Cross for distinguished service in North-western Europe; Mr. T. H. Summerson was appointed a Justice of the Peace for the County of Durham; Viscount Weir was re-elected honorary president of the British Employers' Confederation.

Awards

E. J. Fox Gold Medal.—To Mr. J. W. Gardom, M.Cons.E., A.M.I.Mech.E., President, in recognition of his distinguished services to the industry, particularly in the development of mechanical handling methods.

Oliver Stubbs Gold Medal.—To Mr. J. Roxburgh, A.M.I.Mech.E. He is the author of a number of Papers read before the Institute and its branches, and has actively engaged in various committee activities.

British Foundry Medal.—To Mr. John Vickers, in recognition of the excellence of his Paper, "The Mechanised Production of Aluminium Gravity Die Castings for the Merlin Engine," presented at the 1944 annual meeting. Mr. Barrington Hooper, C.B.E., the donor of the fund out of which the medal and prize are procured, made the presentation to Mr. Vickers at the 1945 annual meeting.

Diplomas.—Diplomas were awarded to the follow-

TABLE I.—*Changes in Membership*, 1945-46.

	Subscribing firms.	Members.	Associate Members.	Associates.	Totals.
At April 30, 1945	152	1,374	1,682	158*	3,366*
Additions and transfers from other grades	13	100	194	55	362
	165	1,474	1,876	213	3,728
Losses and transfers to other grades	—	51	95	13	159
At April 30, 1946	165	1,423	1,781	200	3,569

TABLE II.—*Analysis of Membership at April* 30, 1946.

Branch.	Subscribing firms.	Members.	Associate Members.	Associates.	Totals.
Birmingham	15 (14)	222 (210)	216 (198)	22 (19)	475 (441)
Bristol	5 (5)	67 (64)	72 (66)	1 (1)	145 (136)*
East Midlands	9 (9)	98 (94)	201 (201)	15 (12)	323 (316)
Lancashire	19 (18)	160 (146)	249 (243)	15 (15)	443 (422)*
London	21 (18)	288 (279)	226 (214)	13 (8)	548 (519)
Middlesbrough	1 (1)	40 (41)	72 (71)	31 (29)	144 (142)
Newcastle	13 (13)	36 (37)	41 (31)	36 (29)	126 (110)
Scottish	11 (10)	127 (126)	266 (247)	11 (7)	415 (390)
Sheffield	7 (7)	103 (104)	96 (92)	1 (2)	207 (205)
Wales and Monmouth	3 (2)	60 (60)	78 (75)	26 (20)	167 (157)
West Riding of Yorks.	11 (10)	83 (81)	126 (119)	13 (4)	233 (214)
South African	47 (43)	106 (102)	105 (98)	15 (12)	273 (255)
Unattached	3 (2)	33 (30)	33 (27)	1 (—)	70 (59)
Totals	165 (152)	1,423 (1,374)	1,781 (1,682)	200 (158)	3,569 (3,366)*

Figures in brackets are totals at April 30, 1945. * Revised.

ing members during the year:—Mr. A. Dunlop (Birmingham); Mr. E. R. Dunning (Birmingham); Mr. P. T. Holligan (London); Mr. W. Montgomery and Mr. J. Doig (Scottish); Mr. G. W. Nicholls (W. Riding of Yorkshire); Mr. C. A. Payne (East Midlands); and Mr. W. West and Mr. C. C. Hodgson (Lancashire).

Edward Williams Lecture

The Edward Williams Lecture for 1945 was delivered at the annual meeting in London on June 16, by Mr. W. C. Devereux, F.R.Ae.S., whose subject was, "The Future of the Light Alloy Foundry Industry."

Branch Activities

Full syllabuses of meetings have been held by all branches and sections of the Institute during the year, and in addition most branches have been able to arrange one or more works visits. Social functions have also been resumed or continued by a number of branches, although necessarily on a somewhat more restricted basis than pre-war. In all, over 112 meetings were held by the various branches during the 1945-46 session, and generally speaking there appears to have been an increase in the average attendances.

The Council desires to take this opportunity of tendering its thanks to the branch presidents, secretaries, and other officers for the success of their efforts during the year and also to the management of works visited by members, and the authors of papers.

A further publication made available during the year is, "Lectures in Foundry Practice," prepared by members of the Education Committee and edited by the Secretary, Mr. T. Makemson. This publication, which was prepared principally at the suggestion of a number of teachers, takes the form of specimen teaching notes designed to cover the City & Guilds Intermediate Examination Syllabus in Foundry Practice, and it is hoped that it will assist in bringing teaching of foundry subjects to a uniformly high level throughout the country. A further publication on similar lines covering the City & Guilds Final Examination Syllabus is in course of preparation, and it is hoped to make it available before the end of the current year. Copies of these notes are available only to teachers or apprentice instructors or to educational establishments or companies operating approved courses.

Advance copies of the Papers presented to the 1945 annual meeting were made available in the normal way, and publication of the Papers to be read at the 1946 Conference is also in hand. In addition, two reports from Sub-committees of the Technical Council, (1) "The Second Report on the Basic Cupola," and (2) "The Determination of the Gas Content of Sand Cores," have been approved for publication, but will not be discussed at the Conference.

Educational Activities

The Education Committee of the Council has continued its diverse activities during the year under the chairmanship of the President, Mr. J. W. Gardom, Mr. S. H. Russell having found it necessary to relinquish this office in October, 1945. Apart from the preparations and publications of the two series of "Lectures in Foundry Practice," to which reference has already been made. the Committee has taken other steps in the direction of rendering direct assistance to teachers of foundry subjects.

In the first place, it noted the recommendations of the McNair Committee that increased facilities should be made available to teachers of technical subjects to make periodic returns to industry for the purpose of keeping abreast of their subjects. The Ministry of Education, presumably acting upon this recommendation, has recently announced certain modifications to their administrative arrangements which will assist toward this end, and the Institute has now expressed to the Ministry its preparedness to assist teachers desiring to refresh their knowledge of the technique of founding, to utilise their periods of industrial release to the best advantage. Furthermore, through the Education Committee enquiries are being made as to the possibility of periodically arranging short refresher lecture courses for teachers at some convenient centre.

During the year the Institute has accepted an invitation from the Joint Committee on Metallurgical Education to be represented on that body, and has appointed Mr. J. W. Gardom to act in that capacity. The Joint Committee has been established by the Iron and Steel Institute, the Institute of Metals, the Institution of Metallurgists, and the Institution of Mining and Metallurgy, with the following terms of reference:—

> To advise, and act on behalf of, the Institutes on all matters concerning metallurgical education excepting National Certificates in Metallurgy, provided that no liability for substantial expenditure be incurred without authority.

One of the most outstanding events of the year so far as higher metallurgical education and training are concerned has been the offer made by the Mond Nickel Company, Limited, through its chairman and managing director, Dr. W. T. Griffiths, of the sum of £50,000 to be donated during the next seven years for the provision of Fellowships in Metallurgy. The offer has been made to and most gratefully accepted by all the metallurgical institutes represented on the Joint Committee on Metallurgical Education, and including this Institute, and it is expected that the scheme will be administered by that Committee or a special subcommittee of it in conjunction with representatives of the donors.

As is already known, the Institute has for a number of years endorsed National Certificates in Mechanical Engineering in respect of foundry subjects. and has recently entered into a similar arrangement in connection with National Certificates in Metallurgy. During the present year it has been resolved to offer to make similar endorsements upon National Certificates in Production Engineering, and this desire has been communicated to the Committee responsible for the administration of this scheme. In the event of this last arrangement being satisfactorily concluded, it is thought that a useful step will have been completed towards the provision of foundry education to a National Certificate level.

The results of the 1945 City & Guilds examination in Foundry Practice and in Pattern-making are given below. The Education Committee has recom-

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mended 36 applicants for acceptance as external candidates for the 1946 examination in these subjects.

Pattern-making—Intermediate.

Number of Candidates.	Pass 1st Class.	Pass 2nd Class.
59	4	43

Pattern-making—Final.

21	6	9

Foundry Practice and Science.

58	19	29

Buchanan Medals and Book Prizes were awarded to candidates in the foregoing examinations as follows:—

Pattern-making—Final.—Buchanan Silver Medal, no award; Book Prizes, Mr. J. Allison and Mr. E. S. Hennerry.

Foundry Practice and Science.—Buchanan Silver Medal, Mr. F. D. Roper; Book Prizes, Mr. F. Rodgers and Mr. A. Searby.

Mention may here be made of the comprehensive investigations and action being taken in the London area for the provision of adequate educational facilities, particularly for craft apprentices. This work is being carried out by a Sub-committee of the London branch council, which is also representative of trade and educational interests. A course leading to the City & Guilds examinations has already been successfully launched at the Borough Polytechnic, and other districts in the area are being surveyed with a view to commencing further classes where they can be adequately supported.

Kindred Associations

Cordial relations continue to exist between the Institute and a number of other societies and institutions. Mention has already been made of the Institute's participation in the work of the Joint Committee on Metallurgical Education along with four other metallurgical institutes, and of the joint arrangements with the Institute of Metals, the Iron and Steel Institute, the newly established Institution of Metallurgists, and the Institution of Mining and Metallurgy for the administration of the Fellowships established by the Mond Nickel Company, Limited.

A number of joint meetings between branches of the Institute and local sections or branches of some of the foregoing Institutes has been arranged during the year. Similar joint meetings have been held with the Institute of Vitreous Enamellers.

The President, vice- and past-Presidents of the Institute had the pleasure of entertaining a number of Presidents of kindred engineering societies to luncheon in London on June 15, 1945, and it is hoped that further opportunities of providing similar hospitality will be found from time to time in the future.

With the termination of hostilities, a partial resumption of normal relations has been possible with some of the European Foundry Technical Associations. The Institute was represented at the first post-war conference of the Association Technique de Fonderie in Paris last October. by Mr. V. C. Faulkner, past-President. Exchange of publications with this and the Belgian Association has been resumed, as will be the official exchange of papers with the French Association during 1946.

The Council is also pleased to report that a communication has been received from Dr. Gierdzerjewski, president of the Polish Association, who stated that efforts were being made to revive Association activities in his country.

The Council tenders to the American Foundrymen's Association their warmest congratulations and good wishes on the attainment of their 50th anniversary this year. It has fortunately been possible for the Institute to arrange for a small party of twelve of its members to participate in the Association's Cleveland Convention from May 6—10. Included in this number are the Secretary, Mr. T. Makemson, and Mr. Basil Gray, author of the Institute's official exchange paper. The Council regret that owing to shipping and financial restrictions at present in force, it has not been possible to include in the party more of those who made application. After attendance at the Convention the members of the party will be making informal tours of various foundries, mainly in the Eastern and Middle West States.

Appointment of Representatives

The Institute continues to be represented on a large number of committees appointed by educational establishments, trade associations, the British Standards Institution, and other kindred organisations. A complete list of these appointments will be published in a revised edition of the List of Members of the Institute, which has been authorised for publication in the autumn of 1946.

Of particular importance was the invitation from the Ministry of Labour and National Service for the Institute to be represented upon the committee which the Ministry appointed to enquire into foundry amenities. The Institute accepted this invitation and appointed Mr. J. W. Gardom as their representative.

Bye-laws

At the adjourned annual general meeting of the Institute, held at Manchester in October, 1938, a resolution was adopted which authorised certain alterations to be made to the bye-laws of the Institute, subject to H.M. Privy Council's approval for such alterations being granted. These alterations necessitated a petition being made to H.M. Privy Council for the granting of a Supplementary Charter and this was done just prior

to the outbreak of war in 1939, but unsuccessfully.

Just prior to the termination of hostilities in 1945, the Council made arrangements for the revision of the bye-laws accepted by the 1938 general meeting to be reviewed in the light of present circumstances by a Charter and Bye-Laws Committee, which was appointed under the chairmanship of Mr. D. H. Wood, senior vice-President. This Committee's report was accepted by the Council on February 1, 1946, and the alterations to the bye-laws which it proposed will be recommended for acceptance by the annual general meeting on June 19, 1946. A print of the proposed new bye-laws is being circulated to all members and it will be noted that in principle the present proposals are closely related to those which were accepted in 1938. A number of improvements in wording have, however, been effected, and a number of further minor alterations have been incorporated to render more efficient the general administration of the Institute. The major proposed alteration is, as it was in 1938, that the qualifications for admittance to the various grades of membership should be based upon a combination of practical foundry experience and technical training rather than upon the position which an applicant may hold in his company or firm at the time of application.

Council and Officers

The Council, Finance, Literary and Education Committees, have each held four meetings during the year in London, and at Birmingham, Manchester, and Derby. There have also been a number of meetings of the Charter and Bye-Laws Committee and other special committees appointed by the Council. Meetings of the Technical Council and its sub-committees are referred to elsewhere in this report.

Of the five members of the Council elected by ballot for a period of two years, five retire each year. Those who so retire at the annual general meeting in 1946, are, Mr. H. Bunting, Dr. A. B. Everest, Mr. E. J. L. Howard, Mr. A. Phillips, and Mr. R. B. Templeton. These members are eligible to offer themselves for re-election for a further period of two years.

The Council tenders its thanks to all those who have contributed to the Institute's success during the past year, in particular mention is made of Mr. P. A. Russell, B.Sc., chairman of the Technical Council, Mr. D. H. Wood, chairman of the Charter and Bye-Laws Committee, and Mr. C. W. Bigg, honorary treasurer.

At the annual general meeting in June next, the Council will nominate the following as officers for the year 1946-47.

The nomination for the junior vice-Presidency is made on the recommendation of the past-Presidents' Committee to whom a number of branches submitted names in accordance with Bye-Law 12:—As President, Mr. D. H. Wood; as senior vice-President, Mr. P. H. Wilson, O.B.E., and as junior vice-President, Mr. R. B. Templeton. Mr. Templeton is managing director of Ealing Park Foundry, Limited, London, a member of the Council, and a past-president of the London branch.

Annual General Meeting

The 1945 annual general meeting was held at the Waldorf Hotel, London, W.C.2, on Saturday, June 16. On the preceding evening a session for the presentation and discussion of papers was held, and the meeting was followed by the Edward Williams Lecture, delivered by Mr. W. C. Devereux, an informal luncheon, and three further sessions for the discussion of papers.

Staff

The Secretary, Mr. T. Makemson, M.B.E., continues to be engaged as Director for Iron Castings at the Iron and Steel Control, Ministry of Supply, but has been able to keep in close touch with the Institute's affairs. It is confidently hoped that Mr. Makemson will be released to return to the Institute at an early date.

Signed,

J. W. GARDOM, *President.*
J. BOLTON, *Acting Secretary.*

FOURTEENTH REPORT OF THE TECHNICAL COUNCIL

About 27 meetings of the Technical Council and of its various Sub-committees have been held during the past year. Apart from the Sub-committee activities, details of which are given below, the Technical Council has ensured adequate representation on numerous technical committees of external organisations, particularly the British Standards Institution.

A matter of some importance to the foundry industry during the year was the publication of the draft S.R. & O. relating to parting sands and powders. The Technical Council on behalf of the Institute has raised objection to certain requirements of this draft, and it is understood that these comments along with those received from other organisations are being considered by the Minister of Labour and National Service.

In the non-ferrous field, a Committee of the British Standards Institution has been engaged during the year on the preparation of a Code of Procedure in inspection of copper base alloy castings. The Institute has been represented on the Committee dealing with this matter, and has had the opportunity of commenting upon the draft Code which has been circulated to industry.

It will be understood that much of the work done by the Technical Council and particularly by its Sub-committees is dependent upon the co-operation of a large number of firms with which the members are connected. Not only are such members given facilities for attending the meetings, but in many cases experimental work is carried out on behalf of the Council or a Sub-committee in the works or laboratories of their companies. The Technical Council would like to take this opportunity of expressing to those companies its appreciation of their co-operation.

The Technical Council Students' Fund has continued to be administered during the year. It will be recalled that the Fund was established by Mr. J. W. Gardom, and in view of his expressed wish that his donation should be expended within a reasonable period of time, steps are being taken to increase the uses to which it may be put.

I.B.F. Annual Report

The Sub-committees

The following notes summarise the work of the various active Sub-committees during the year:—

T.S.4.—Grey Iron Test Bar.—This Sub-committee was appointed to formulate the recommended methods of producing separately cast grey iron test bars as specified in B.S.321 and 786. It was under the chairmanship of Dr. A. B. Everest and its recommendations were published as Paper No. 827, which was discussed at the 1945 annual meeting. The methods which the Sub-committee recommended were generally accepted by those taking part in the discussion and the Committee having prepared its reply thereto has been dissolved.

T.S.5.—Malleable Cast Iron Specifications.—The Sub-committee was appointed under the chairmanship of Mr. A. E. Peace to complete the work previously in the hands of the Malleable Cast Iron Sub-committee relating to the revision of Blackheart and Whiteheart specifications B.S.309 and 310. This work has been carried out in conjunction with the Malleable Cast Iron Sub-committee of the B.C.I.R.A., and a number of joint meetings have been held. These two Committees have now agreed proposals for the revision of the specifications, and these have been forwarded to the British Standards Institution. The Committee has been retained while their proposals are being dealt with by the B.S.I. Their proposals include the following points:—

(*a*) Two grades of whiteheart and three grades of blackheart having graduated mechanical properties are put forward in place of one grade of each material.

(*b*) In the case of whiteheart malleable, recommendations have been made for three sizes of test bar in place of one in order that a bar may be representative of the important sectional thickness of the casting.

(*c*) Recommendations are made for the inclusion of minimum yield point values. This is intended as an optional test at the discretion of the purchaser.

(*d*) Alteration in the identification of grades is recommended to allow for higher grades of material to be easily specified as technique is improved.

T.S.6.—Control Tests for Cast Iron.—The Sub-committee was appointed under the chairmanship of Mr. J. Blakiston, but due to his absence abroad during several months of last year, this work was carried on under the deputy-chairmanship of Mr. J. H. D. Hobson.

The Sub-committee has made rapid progress and a comprehensive report is to be published for discussion at the annual meeting, 1946. The report enumerates and discusses a number of control tests mainly applicable to molten grey cast iron before pouring into the mould, and is divided into three sections, the first dealing with Visual Tests, the second with Rapid Analytical Methods, and the third with Mechanical Tests. There are two appendices: (*a*) dealing with the importance of accurate temperature determination, and (*b*) with quick methods of wet chemical analysis.

T.S.7.—Mould Materials for Iron Castings.—The Sub-committee was originally appointed under Mr. A. E. Peace's chairmanship to explore and report to the Technical Council on the possibility of carrying out an investigation on the effect of mould materials on the soundness of grey and malleable iron castings. During the year Mr. Peace was obliged to resign his chairmanship and in the meantime the Committee has met with Mr. A. Tipper in the chair. It is apparent that the work of the Committee is mainly explorative and so far about 200 published papers have been reviewed and abstracted by members of the Committee. It is expected that their recommendation for further work will be placed before the Technical Council at an early date.

T.S.9.—Atlas of Defects in Castings.—The Technical Council has had under consideration for several years the possibility of publishing an authoritative Atlas of Defects in Castings and this work has previously been touched upon by a number of previous Sub-committees in the course of other work. The present Sub-committee, under the chairmanship of Mr. F. Hudson, has collected a large number of photographs and other data and has now prepared its first section of this atlas which is being submitted to the Technical Council for approval before final publication. This first section will be descriptive of approximately 30 typical defects, and it is probable that the method of publication finally adopted will enable supplements to be conveniently added at later dates.

T.S.10.—Basic Cupolas.—This Sub-committee, under Mr. L. W. Bolton's chairmanship, is continuing the work commenced by the Melting Furnaces Sub-committee, whose first report on basic-lined cupolas was presented for discussion at the 1944 annual meeting. A second report on this subject has been approved for publication and will be made available with the papers to be presented at the annual meeting, 1946, but will itself not be included in the programme for discussion.

Further work is continuing, and in view of the fact that the cupola furnaces on which the original experiments were made are now no longer available to the Sub-committee, and because of promising results obtained in experiments conducted on ladle treatment, the Sub-committee is turning its attention in that direction.

T.S.11.—Gases in Cast Iron.—The extensive nature of this subject was referred to in the last annual report of the Technical Council and in view of the considerable amount of primary research which is necessary before much further progress can be made, the Sub-committee's recommendation that a joint I.B.F.—B.C.I.R.A. committee should be appointed has been accepted. Arrangements are being made to implement this recommendation. The Sub-committee has been under the chairmanship of Dr. J. E. Hurst.

T.S.12.—Dimensional Tolerances for Castings.—The purpose of this Sub-committee is to prepare an authoritative statement which will be a guide to both founders and purchasers as to tolerances which may be regarded as reasonable and allowable in all types of castings. A considerable volume of data has been collected from

a number of firms and the Sub-committee's work during the year has mainly been concerned with analysing and correlating this information. The work is proceeding under Mr. C. H. Kain's chairmanship.

*T.S.*13.—*Testing of Oil Sand.*—The Sub-committee has completed a report on the "Determination of Gas Content on Oil and Sand Cores," which is shortly to be published in preprint form, but will not be discussed at the 1946 annual meeting. The recommended method has not so far been extensively used and the Sub-committee would welcome written contributions on its report. Mr. A. Tipper is chairman of the Sub-committee.

*T.S.*14.—*Light Alloy Test Bars.*—The Sub-committee was appointed under Mr. A. Phillips' chairmanship to investigate proposals received from the Ministry of Aircraft Production for the alteration of test bar procedure for certain light alloys both sand and diecast. The work has proceeded mainly by correspondence and members of the Sub-committee have carried out several series of tests, the results of which have been forwarded to the Ministry, and as a result its work on sand cast bars has now been completed. Further investigation is being made into the chill cast bars.

*T.S.*16.—*Cast Iron Specifications.*—The Sub-committee has been appointed to consider the scope and test requirements of the present British Standard Specifications 321 and 786. Considerable progress has been made within the Sub-committee and further information will be made available as soon as its proposals have been finalised.

*T.S.*17.—*Stress Relief Annealing of Iron Castings.*—During the year the Technical Council received an invitation from the British Internal Combustion Engine Research Association for information on the stress relief annealing of iron casting. The Association was mainly concerned with castings for I.C. engines, but was seeking information on a wider range of products. The Sub-committee is therefore making a review of current practice particularly with regard to castings other than those of which the Association is concerned, and arrangements are being made for the two organisations to compare their information and recommendations at a later stage. The results of this work may be published after consultation with the B.I.C.E.R.A..

Signed,

P. A. RUSSELL, *Chairman, Technical Council.*

Publications

Due to manufacturing delays in binding materials it has not been possible to publish Volume XXXVIII during the period covered by this report. It is expected that publication will be made by June. The volume will contain a selection of the Papers read before branches during the 1944-45 session and those presented to the annual meeting in 1945.

Publication of Special Report No. 5, "The Education and Training of the 'Foundryman' Apprentice and Graduate Entering the Industry," was made in May, 1945. Copies were sent to all members, and have been widely distributed throughout foundries and educational establishments both in this country and abroad.

In December last, the Institute, on behalf of the Joint Committee on Sand Testing, published the Committee's First Report on this subject. The Report was entitled, "Methods of Testing Prepared Foundry Sands," and describes methods and recommended procedures for the routine testing of all types of prepared moulding and core sand including naturally-bonded sand, synthetic moulding sand, either clay or naturally-bonded or a mixture of both, and core sand containing organic binders with or without clay-bonded sand.

COTSWOLD CALLING!

The Birmingham Conference of the Institute of British Foundrymen concluded in the happiest vein as the newly elected President, Mr. D. Howard Wood, and Mrs. Wood, invited the members to a garden fête at their home "Cotswold," Barnt Green. Amidst charming surroundings the guests could play clock golf, darts, skittles, or have their fortune told! Music was provided by the South Birmingham Philharmonic Orchestra and the Alvechurch Bellringers. An especially interesting feature was a hunt for hidden treasure. Despite none too bright weather, a thoroughly enjoyable evening provided a splendid climax to a memorable gathering.

I.B.F. ANNUAL CONFERENCE

(*Continued from p.* 210.)

received from H.M. the King; Mr. E. P. Beale, M.A. (Pro-Chancellor, Birmingham University); Mr. H. H. Berresford (Chairman of the Joint Iron Council); Mr. FitzHerbert Wright (Chairman of the Council of Ironfoundry Associations); Mr. G. T. Hyslop (President, Association of Bronze and Brass Founders); Mr. F. A. Martin (President, British Steel Founders' Association); Mr. A. H. Sturdee (President, Light Metal Founders' Association); Dr. Harold Hartley (President, British Cast Iron Research Association); Mr. J. G. Pearce (Director, British Cast Iron Research Association); Mr. W. S. Grainger (Chairman, Institute of Vitreous Enamellers); Mr. Kenneth H. Adams (Warden, Worshipful Company of Founders); Mr. V. Everard; and Sir John M. Duncanson (Commercial and Technical Director, British Iron and Steel Federation).

Mr. Barrington Hooper also offered congratulations to Mr. Wheeler on the distinction he had received in the last Honours List.

MR. VINCENT EVERARD, M.I.Mech.E., responded. On behalf of the guests he offered their congratulations on the faultless organisation of the Conference and their thanks for the extremely happy evening they had enjoyed.

Difficult Times Ahead

SIR JOHN M. DUNCANSON, who also responded, recalled the President's reference to friendship, which he said, expressed the reason why the guests were present. The times through which we were passing, and the times we had to face in the future, abounded with difficulties; but we should live through them, knowing that we had good friends working with us, and we should carry out our tasks happily. This little old country would never lose its great faculty of combining friendship with work. He was delighted to be present as one of the Institute's guests in that spirit of friendship.

MEEHANITE RESEARCH INSTITUTE

ANNUAL MEETING IN EDINBURGH

The 14th annual meeting of the Meehanite Research Institute was held in the North British Hotel, Edinburgh, early this month (as briefly reported in an earlier issue of the JOURNAL) when there was present for the first time since 1939 a representative of a Continental licensee. It was a matter of general regret that Mr. Oliver Smalley, O.B.E., the chairman, who had been expected to attend, was unable to do so because of a last minute cancellation of the sailing of the ship in which he was to travel from New York.

The first day of the conference was devoted to meetings of the board of directors of the Institute, and the committees of technical research and education of apprentices.

In opening the main session on the second day, Mr. N. E. Rambush, vice-chairman, presided, and urged the need for resarch and still more research if the Meehanite organisation were to hold its place in the foundry and engineering industries. He stressed that every licensee must take part in some of the work.

Technical Research Report

The report of the technical research committee was presented by the convener, Mr. G. B. Taylor. It showed that a considerable amount of work had been carried out during the year, nine reports had been completed and presented for discussion at this meeting. There were 20 researches in progress, and a number of others were being planned. The reorganisation of the committee, on the lines suggested a year ago, had been instrumental in getting work going forward in an active progressive manner. The report was adopted, and Mr. Taylor re-elected chairman for another year. Mr. E. W. Harding was elected vice-chairman in the place of Mr. F. Buckley, who had resigned.

The report of the education committee was presented by Mr. W. H. Richards. It showed that the committee had been very active, in exploring methods for putting the scheme, approved at a previous meeting, into working form, so much so that the work originally assigned to the committee had been completed. It was stated that arrangements had been made for the establishment of a school for training apprentices in general foundry practice in conjunction with a course of instruction within the Meehanite group.

The reports having been approved, the meeting proceeded to the discussion of something like 30 papers and technical reports, dealing with various matters appertaining to Meehanite production and general foundry technique.

Discussion of Reports

The reports upon the details of manufacture and service performance of Meehanite castings by licensees in Britain, U.S.A., South Africa and other countries, always arouse considerable interest and discussion, and this event was no exception.

Among other matters dealt with were reports on "Railway Loco Castings," "Adhesion of Tin Coatings to Cast Iron and Meehanite," "Surface and Bending Stresses of Heat-treated Meehanite Gears," "Stress Analysis an Aid to Casting Design," "Mechanisation for Small Tonnages," "Foundry Sands and Bonding Clays," "Impact Testing" (illustrated by slow motion films), "Investment Moulding of Meehanite to Precise Dimensions," "Carbon Control of Cupola Metal in Relation to Coke Characteristics," "Effect of Ferrostatic Head on Casting Soundness," "Creep Properties of Different Meehanites," "Effect of Heat-treatment on the Endurance Limit of Alloyed Meehanite," also several reports on the "Effect of Elevated Temperature of Various Meehanites and Relative Growth of Meehanite and Cast Iron in a Vacuum," and finally "A Rational Selling Plan for Meehanite."

Core Blowing Research

There were two reports which aroused unusual interest—"The Measurement of Surface Roughness of Meehanite Castings," which detailed the results of pioneering work in an attempt to develop a standard method of assessing the quality of castings from the point of view of skin finish. The second was the "Study of the Basic Principles of Core Blowing." This was an account of endeavour to explain the behaviour of the sand during routine production of various shapes of cores. The report was illustrated by three films taken with the ultra slow motion (2,500 frames per second), and showed that in the case of the machine and under the conditions obtaining, many of the theories which have been advanced as to the action of the sand stream are at variance with the actual facts. This report was regarded as the outstanding feature of the meeting.

The second day of the conference concluded with the annual dinner over which Mr. John Cameron presided.

The third day was occupied with the continued discussion of papers, the forenoon session being a general one. In the afternoon there were separate sessions for the metallurgists, presided over by Mr. E. M. Currie, supported by the staff of International Meehanite Metal Company, Limited; the merchandising committee meeting, presided over by Mr. N. E. Rambush, and the advertising committee, with Mr. W. H. Harper in the chair.

All the Scottish licensees extended an open invitation to members to visit their foundries during the conference week.

THE CAPITAL ISSUE COMMITTEE has rejected an application by Henry Hope & Sons, Limited, manufacturers of metal windows, etc., of Smethwick, to make an issue of 100,000 £1 ordinary shares at 40s. per share on the grounds that the price offers too large an element of bonus.

AN ANNOUNCEMENT BY THE directors of Nchanga Consolidated Copper Mines reveals plans involving the raising of £4,000,000 new capital to transform the concern into one of the world's big copper producers. Nchanga has hitherto been the least important of the four Northern Rhodesian mines, but when projected production of 64,000 tons per annum is achieved, the mine will rival all except the Rhokana concern.

CASTING REFLECTIONS

Presidential address delivered at the annual Conference of the Institute of British Foundrymen

By D. HOWARD WOOD

The history of founding from the very earliest records to the present day is for me a most fascinating subject, and one with which I had anticipated dealing; this, however, is the first post-war conference and it would seem more fitting to survey briefly the activities of the industry during the war, refer to some of the immediate problems, and anticipate possible future developments.

You have paid high honour to me and to the Birmingham, Coventry and West Midlands branch by electing me as President. It is perhaps fitting, not that I should be elected President, but that Birmingham should be the chosen city for the first post-war conference —Birmingham the heart of the industrial Midlands, the centre of England, the city of 1,000 trades, situated in the middle of a dense mass of steel, iron and non-ferrous foundries — nearly 300 foundries within a 20-mile radius of Birmingham. Incidentally being a Black Country man I would suggest that nowhere is there more highly skilled labour than that in the Black Country where a large percentage of men still take great pride in their work .

MR. D. HOWARD WOOD,
The Newly Elected President of the I.B.F.

Perhaps the most appropriate reason for the Conference being held in this city is the fact that 42 years ago the Institute was born here. The faithful seven who inaugurated the founding of the British Foundrymen's Association laid well their foundations, and any President would be entirely lacking in his duty if he omitted to pay tribute to those foundrymen who, in their urgent desire to gain and spread knowledge of the art of founding, brought into being this Institute.

Foundation of the Institute

It is a source of great pride and satisfaction to me personally that Mr. Fred Cook, who had as much to do with the foundation of this Institute as any man, has today seconded my election as President. With Mr. Cook I have verified the following facts regarding the formation and early foundation of the Institute which I think should be placed on record:—

The seven founders of the Institute in 1904 were: Mr. R. Buchanan (the first President), Mr. J. Ellis, Mr. F. W. Finch, Mr. F. J. Cook, Mr. E. Vickers, Mr. Shore and Mr. C. Moorhead. Mr. Cook is the only remaining living member.

At the first gathering it was decided not only to form the British Foundrymen's Association, but to hold a convention in a few weeks' time. This convention was duly held in Manchester on August Bank Holiday, 1904, when the membership had reached 98, and no less than 92 attended the convention. The original subscription was fixed at 7s. 6d. per annum in order to attract artisans. In 1909 the subscription was raised to a guinea for full members, and half-a-guinea for associate members. One member of the council objected to the increase on the grounds that it would ruin the Association as no man would be prepared to pay such a high subscription. That this objection was not justified was proved by the fact that there was a greater influx of members that year than in any previous year. History in this respect would seem to be repeating itself.

A daughter of the first President, Mr. R. Buchanan—that wise counsellor and friend of all foundrymen—has taken a very active interest in the arrangements for this Conference. I refer to Mrs. T. H. Gameson, herself the wife of a well-known foundryman and member of the Council, who has acted as chairman of the ladies' committee, and in that capacity has been largely responsible for the ladies' programme.

Change of Title

In 1919 when the Conference was held in Liverpool —which incidentally was the first Conference I attended, it was decided to alter the name from the British Foundrymens' Association to the Institute of British Foundrymen. The story of the Institute has been one of continual progress, even during the war its mem-

Casting Reflections

bership has increased by over 50 per cent. Striking testimony surely to the work of the Institute, and I suggest to you that the published findings of our many committees have been of such high value that those personally engaged in the industry have stopped, thought, and taken steps to join the Institute.

Out of this Institute there has grown a child, for in 1925 at a meeting mainly of members of the Institute held in Birmingham, it was decided to form a research association; that body (the British Cast Iron Research Association) has also grown and developed into a strong and lusty organisation. I well remember being present at that meeting and taking some part in the proceedings, and congratulations are offered to the original council of that association on the great progress it has made. I hope it will not be entirely forgotten that the Association owes its existence in a large measure to its parent, this Institute.

Foundry Industry During the War

Let us reflect for a moment on the work of the industry during the war. At the outset it was said it would be a "Cast Steel or Fabricated War" and not a "Cast Iron War," in fact the first director of iron castings seemed to be more concerned with seeing that foundries did not make too much profit, rather than that they made too few castings. Be that as it may, the ironfoundries of this country produced no less than 12,238,000 tons of castings during the war, the steelfoundries, 1,503,000 tons. Incidentally, over four-fifths of all iron castings produced came from one-eighth only of all ironfoundries. The light alloy foundries contributed 259,000 tons of aluminium castings and 106,000 tons of magnesium castings. Unfortunately, I am unable to quote similar figures relating to the bronze and brass foundries. These colossal tonnages reflect great credit upon an industry largely denuded of labour, for many months held in the throes of suspense over proposals for concentration, and generally treated as a branch of industry of no great importance to the war potential. Credit to our industry for this great effort goes in equal measure to all employed in it, from the directors down to the foundry labourers, and by no means least, to the women who played such a magnificent part in this effort. In one foundry alone the percentage of women employed reached a figure of 85, whilst the output from this particular foundry compared favourably with that of any other foundry of similar capacity.

Of the many ways in which the Institute played its part in this achievement, not the least were the efforts of the committees; it was my intention to refer in detail to the work of several committees, but space has necessitated my omitting most of this. An opportunity will doubtless occur later.

Before passing on to the post-war period, reference should be made to the work of the South African branch of the Institute. This branch was equally active in advising on technical problems, assisting in increasing foundry production, and generally co-operating with the Government and other public bodies.

The Immediate Post-War Period

Let us turn for a few minutes to the achievements of the industry in the immediate post-war period. Rapidly meeting changing conditions, it switched over from the production of weapons of war to requirements for peace, and in a few months the output of baths, rainwater goods and other requirements for the building industry was well under way. In connection with the housing programme, it is, I believe, true to say that of the "bits and pieces" which have prevented the completion particularly of the pre-fabricated houses, castings cannot be included. Great credit is reflected upon the executives of the foundry industry for the fact that whatever shortages there may have been the ironfoundry industry has not let the country down.

The Institute has been very much alive to the problems which would face the industry during the change-over period, and in this connection I should like to cite the work of two other committees. Anticipating the possible labour position at the end of the war, members of the Education Committee devoted a vast amount of time and effort to the preparation of two reports on "Apprenticeship Training & Education," and these were published in December, 1944, and May 1945. The demand from outside sources for copies of these reports was indicative of the value placed upon them both in this country and abroad. Further, the preparation of "Notes for Teachers"—a very fine publication— involved the members of the Education Committee in a considerable amount of time, and these notes, again proving their value by the demand, have been of great service to teachers.

At the suggestion of Mr. J. W. Gardom, the Mechanical Development Committee was formed in 1943 to prepare a report on the equipment available to foundries proposing to adopt either complete or partial mechanisation. This Report was neither designed nor intended to be a "blueprint" from which a foundry could be mechanised, but only to indicate the various types of mechanical aids which were available for selection. Here again the post-war shortages of labour and demand for castings reflect the intelligence and anticipation of the sponsor of the scheme.

Recruitment of Foundry Labour

None can doubt that these shortages are of considerable magnitude. At the moment, one of the major bottle-necks in the production of this country is castings; this is not due to the lack of capacity of the foundries, but to shortage of labour. In many directions efforts have been made to overcome this difficulty by the mechanisation of foundries, but such schemes cannot be carried through in a day, consequently the benefits of mechanisation will not be felt in the majority of cases for months yet to come.

With a view to inducing labour into the foundries a number of apprenticeship and other training schemes are in operation, and in several cases have proved very

successful. However good these schemes may be, they take time before they can really become effective. It is surely necessary, therefore, to bridge the gap, and that this can be done successfully has been proved. One ironfoundry re-opened some four or five months ago with a nucleus of 10 skilled men. This foundry is engaged on the production of a particularly accurate type of casting, and the 10 men who had previous experience of this production included not only moulders, but fitters, grinder assemblers and pattern-maker. In five months 107 trainees have been taken on, and of these, 22 left or were discharged; of the remaining 85, 64 proved satisfactory on the foundry floor and are now producing castings. Practically the whole of these are either boys or ex-servicemen. In talks with each of them it was discovered that they were all happy in their work and proud to be producing castings.

Delving into the secret of the acquisition of this labour, it was discovered that a boy of say 15 is engaged at the local rate, an adult trainee at foundry labourer's rate, and put on to coremaking. In each case there is an increase of 1d. per hour in two to three weeks. A few weeks after starting they are trainee moulders. The average time before a trainee reached grade 3 moulder is nine weeks; in 12 to 14 weeks he has normally reached moulder grade 2, and some exceptional trainees have already reached grade 1. One boy of 16 explaining why he had only made 20 moulds by hand in seven hours, instead of his usual 30, said that he was also training an ex-soldier (the ex-soldier being 31). Boys are curious animals, they resent being put to sweep the shops for weeks or months, and much prefer to be doing creative work, and if after say two months' employment in a foundry, a boy, or even a man, can actually be producing moulds, then he appears to be as happy as the other sand boy.

Foundry Welfare

Care is taken to see that their work does not interfere with their physical development, particularly in the case of the boys. They are examined monthly by a doctor, who is everybody's friend; he also walks round the foundry fairly frequently to watch the work and condition of the workers. If on checking up a boy, it is found that he is not developing, inquiries are made into his home conditions, amount of food he is receiving, and the like. One other, but very important point it was learned, is that refreshments which include sandwiches served at mid-morning and mid-afternoon, as well as a good hot lunch are essential to enable these trainees to produce results. In passing, it would be a great benefit if soap and towels were released by the Board of Trade for all employees. It should be mentioned that the boys and older trainees are given talks by the members of the foundry management, and also attend technical school in the evenings. Incidentally all applications for employment whether ex-servicemen or boys are received with the friendliness and courtesy usually reserved for one's best customers; a chat over a cigarette enables the managing director to judge whether he is capable of being trained. Humane treatment of the boys and a personal interest on the part of not only the foreman but also the directors is of first importance.

This case has been cited in some detail, though much more information was gathered, in the hope that it may be of some assistance to many foundries who find difficulty in obtaining trainee labour. Real personal interest, encouragement to achieve their ambition for creative work, and urging the development of the brain and muscles, seems to be the secret of the success. Such is the keenness to undertake foundry work, that in spite of the attractions of numerous other trades, there is a labour waiting list of over 20.

Team Spirit

In a foundry in another branch of the industry where full facts were obtained, it was found that the labour shortage had been amply met by an unusually wide application of payment by results; not only are all employees paid on a piece-work basis, the mid-morning breaks of 10 minutes are paid for at day rate, and the labourers receive a proportionate remuneration to the moulders' earnings. The foremen are paid a percentage of the saving in cost of production over the estimated cost in their department. Perhaps the principal effect of this is the saving which is brought about in fuel consumption, consumable stores, and the like. The executives and even the management share in the profits. In this foundry not only is there no difficulty in obtaining labour, but a happy team spirit prevails throughout the large organisation.

Is there a lesson to be learnt from these examples? I think so. When speaking to the junior section of the Birmingham branch in 1935 I then stated my belief that the inherited skill of the foundry artisan was vanishing. Its place must be taken by highly-trained shop executives, backed by research and development applied to the everyday problems of the foundry, competent to supervise and direct labour utilising its aptitude rather than its inherent skill. Is that not doubly true to-day? What have we to offer as an inducement? In too many foundries, unfortunately, very little.

The science of the engineer has been proved capable of being wedded to the art of the foundryman, but I suggest that there have been too few happy marriages. Let us plan to create conditions which will prove attractive to the young men on whom we shall rely to keep our industry in the forefront. It is not necessary that in order to produce castings men should work continuously in a heavily dust-laden atmosphere, and in conditions generally, which surely might be considered prejudicial to health.

The Future

This is a privileged occasion, and I am going to take advantage of it to let my imagination run riot for a few minutes as to the future. Earlier I referred to the fact that the founders of this Institute laid well their foundations. The motto they chose, "Science Hand in Hand with Labour," seems particularly apt

Casting Reflections

to-day. It is in this connection I was extremely interested to read the letter addressed by Dr. W. T. Griffiths (to whom congratulations are offered on his recent elevation to a knighthood) to the President of the Institute conveying the magnificent offer of £50,000 from The Mond Nickel Company, Limited. The particular words were: "While in no way seeking to diminish the enthusiasm which seems to be spreading for increasing research, I feel sometimes that inadequate attention is being given to what is in my view of at least equal importance, namely, the provision of means by which the results obtained in the research laboratory can be utilised in industry. Indeed, I am not sure that it is not in this direction rather than in that of the carrying out of research of adequate quality, that this country has in the past been somewhat behind other countries such as America and Germany. Both questions, that of increasing research and that of securing the prompt and effective utilisation of research results are related to a third; that of the availability for executive and administrative posts in industry, of men able to appreciate the technological significance of research and its results." In the light of these remarks we perhaps have considerable leeway to make up, but that will not prevent us from initiating and developing other trends.

Is it within the bounds of possibility that sand could be conveyed under pressure direct from the sand preparation plant to moulds?

Can we foresee a new Pluto bringing metal direct from the melting furnace to the moulds?

And a very visionary thought—atomic energy is a heat source which in the next 20 years will probably be utilised for producing electricity. Is it not possible that the same heat source could be used for metal melting?

Sand has hitherto been the traditional moulding medium, will it always be so? The removal of the difficulties and bad conditions associated with the knocking out of moulds and cores would vastly improve foundry conditions.

Might not the plastic industry produce a medium having all the advantages of sand and yet be easier to remove by solvent or other methods?

Truly "Science Hand in Hand with Labour" opens a vista of almost boundless opportunity.

The "F. J. Cook Award"

It is with the conviction that within the Institute there are the brains and skill to keep our industry in its eminent position that I, and through me, the Council, would like to make an immediate contribution towards the attainment of our desires.

As a slight incentive to members—embracing all grades—to exercise their skill and thought in the direction of suggesting practical improvements in amenities in foundries and foundry conditions, I propose to offer awards for the best practical suggestions forthcoming within, say, the next six months. The simple conditions are being drafted and submitted to the Council for approval, and I hope they will appoint a committee of three referees to judge the entries. The entries are to be submitted not later than January 31, 1947. The main award will be £100, and there will be two recognition prizes of £25 each. It may, I think, be regarded as appropriate if the name of Mr. F. J. Cook is associated with the scheme, and I suggest it be known as the "F. J. Cook Award."

Inspiration and Confidence

The first founders of metals—some 3,000 years B.C. or say 5,000 years ago—met and overcame difficulties, without the help of mechanical aids, at least as great as any we have to contend with to-day. Can we not therefore draw inspiration and confidence from the knowledge of their achievements, and go forward with the assured trust that whatever demands are made upon us for castings, we will make and deliver them.

Architects prepare plans and drawings of fine and even magnificent designs for ornamental castings in bronze and iron. Engineers design the most elaborately complicated system of miniature rabbit warrens—more intricate than Nature ever imagined—and expect these to be surrounded by metal often of a thickness of a few thousandths part of an inch. I cast no reflections upon them, only admire their art and skill, but would remind them that frequently much greater art and skill is demanded from the founder who has to *make* the castings.

We are workers together in one of the most ancient and honourable industries in the world; let us never cease to emphasise to every foundry employee—director to labourer—that he is playing an actual part in the scheme of making castings, a part from which he can derive satisfaction and take pride.

PUBLICATIONS RECEIVED

Malleable Iron Facts—No. 22. One of a series of bulletins issued by the [American] Malleable Founders' Society.

This issue carries on each of its four pages a series of photographs of motor-cars of the 1901, 1911, 1923 and 1946 vintages. In each case are given the contemporary specification for mechanised properties, and the components which the model incorporated, made from malleable cast iron. The tensile properties have risen from 40,000 lb. per sq. in. associated with 2.5 per cent. elongation to 53,000 lb. and 10 per cent. elongation. The number of components incorporated has risen from two to six plus. This type of publicity is excellent.

Foundry Practice—No. 80. The house organ of Foundry Services, Limited, of Long Acre, Nichells, Birmingham, 7.

The article on "Ironfounding" is continued, and opens up a discussion on 2.L.33. The latter brings into the limelight the occurrence of under- and over-modified structures. It is suggested that small quantities (say 20 to 30 lb.) are especially liable to fail, whilst large bulk would modify properly. This is a thoroughly good subject for discussion.

NATIONAL PHYSICAL LABORATORY

Last week, the National Physical Laboratory at Teddington was opened for inspection by the General Board of the Laboratory, delegates to the Empire Scientific Conference, and representatives of various scientific activities. Of major interest to our readers are the developments noted by the Metallurgy Division, and below we detail some of the major exhibits which were on view:

Application of X-ray and Electron Diffraction to Metallurgical Problems

The techniques of electron and X-ray diffraction are being fully utilised in studying metallurgical problems. Work is proceeding on the atomic structure of alloys, in particular iron-nickel-chromium; and an apparatus has been constructed for obtaining X-ray diffraction patterns from block specimens of metals at elevated temperatures up to 1,000 deg. C. In order to follow the rate of phase changes electronic methods of recording the X-ray patterns instantaneously with the aid of Geiger counters are under development. Research is also in active progress on the changes in atomic and crystallising arrangement of metals under stress, and a new combined X-ray and tensile testing machine has been developed for special study of the atomic mechanism of deformation of metals at room temperature and also at elevated temperatures; it has been possible by the apparatus to obtain the stress-strain curve for the atomic lattice of metals and new data on the mechanism of deformation have already been obtained. In general, the work of this section may be summarised as an approach to metallurgical problems from the atomic standpoint.

Application of the Electron Microscope to Metallurgy

Some of the unsolved problems in metallurgical science are being referred to electron microscopists in the hope that the high resolving powers available in their instruments, will reveal some significant clues which have remained hidden under the relatively low powers available in optical microscopes.

The application of electron microscopes to metallography is, however, made rather troublesome by the necessity for transferring the original specimen into a form suitable for examination in this new instrument. The specimen is first highly polished so that its surface is flat. It is then etched in an appropriate reagent so that the various constituents are attacked differentially and are revealed as geometric features on the surface of the metal, thus a constituent which is relatively little attacked will stand proud of the general surface.

A cast of the surface is then made, a typical method is to flood the surface with a solution of a plastic. On drying, the plastic forms a thin film which is in intimate contact with the metal on one side and which has been pulled flat on the other side by surface tension. The thin film is then detached from the surface of the metal and is examined in the electron microscope. A picture is obtained in terms of the varying thickness of the film; thus elevated areas on the specimen lead to relatively thin areas in the film and then to relatively bright areas in the picture. Thus, finally, constituents in the metal which are little attacked by the etching reagent are revealed as light areas in the pictures and heavily attacked constituents lead to dark areas. In spite of the indirect method of examination, pictures have been obtained in the electron microscope at magnifications of 10,000 diameters which are superior in definition to those obtained in optical microscopes at a magnification of 1,000 diameters.

Production of Refractory Ware

Progress in metallurgy involves a gradual increase in the temperatures of many industrial operations, and in this respect the needs of research are even more exacting. The production and utilisation of high temperatures are unfortunately subject to numerous limitations associated with the properties of refractory materials, and for many years it has been necessary for the Laboratory to produce refractory ware specially adapted to the demands of research. The preparation and melting of pure metals are particularly dependent on the provision of suitable refractories. Thus, thoria crucibles have been used for determining the melting points of metals of the platinum group, beryllia crucibles are suitable containers for molten beryllium, and alumina crucibles for aluminium.

The pure oxides mentioned above have high melting points, and to make satisfactory ware from them it is necessary to use high firing temperatures. For this purpose various types of furnace have been developed in the Laboratory, including a very efficient recuperative gas-fired kiln. The air supplied to this furnace by the suction of a chimney some 40 ft. high passes through a nest of refractory tubes heated from the outside by the exhaust gases from the downdraught oven. The oven is evenly heated by luminous flames, and the use of a chimney for the induction of air gives silent operation combined with reliability. The furnace has a long life at a working temperature of 1,750 deg. C. Higher temperatures are easily obtained either by reducing the life of the furnace, or by using superior, and therefore very expensive refractories. It should, however, be remembered that at temperatures exceeding 1,750 deg. C. chemical reactions between different refractory materials occur readily, and difficulties are often encountered in supporting the objects to be fired. For this, and other reasons, it is desirable to reduce the firing temperature. Progress in the technique of producing bodies of pure oxides has already achieved results of this kind, and there is hope of further improvement.

Iron-Nickel-Chromium Alloys

The preparation of pure metals and a study of their properties are of fundamental importance and work of this nature has been carried out for many years at Teddington. The techniques developed during this work on the preparation of pure metals, and their alloys, of high melting points are at present being utilised in a study of the ternary alloys of iron, nickel and chromium. These alloys form the basis of many oxidation and corrosion-resistant alloys but there are ranges of composition and temperature over which excessive brittleness may occur due to the formation of a brittle constituent usually referred to as the sigma phase. A knowledge

National Physical Laboratory

of the exact location of these ranges is of obvious importance, and their determination in the pure ternary iron-nickel-chromium is at present being undertaken. The alloys are made by melting together the previously prepared pure metals—iron, nickel and chromium—*in vacuo* or in an atmosphere of hydrogen at reduced pressure. The crucibles used are of thoria-lined pure alumina, specially made in the Refractories Section of the Division. The ingots are then given an homogeneising treatment by heating to 1,325 deg. C. *in vacuo* in a specially designed platinum wound furnace, before being subjected to heat-treatments at various temperatures. The resulting structures are being studied both by microscopic and X-ray methods.

Hydrogen in Welds and Enamelling Defects

It is generally accepted that hydrogen plays a very important part in causing cracks in arc-weld steel joints both in the weld metal deposit itself and also in the adjacent heat affected zone. In the enamelling of welded steel vessels also the presence of hydrogen is very deleterious as it tends to diffuse out during the enamelling process and leads to serious blistering of the glaze. An investigation has therefore been undertaken to determine the amount of hydrogen in weld metal and to ascertain its origin. Standard weld deposits were laid down under rigidly controlled conditions using a series of commercial arc-welding covered electrodes and the hydrogen contents of the various welds determined by the vacuum fusion method developed at the Laboratory. At the same time the potential hydrogen present in various forms in the electrode coatings was determined and it was found that for the series of electrodes examined an approximately linear relationship exists between the total hydrogen in the weld deposit and the total potential hydrogen in the particular coating of the electrode with which it was made. It is therefore apparent that in order to eliminate hydrogen and its probable deleterious effects from weld metal, it is necessary to keep the potential hydrogen content of the electrode coating to a minimum.

TITANIUM IN STEEL

Spectrophotometric determination of titanium in steels is the subject of an article by ALFRED WEISSLER in "Industrial and Engineering Chemistry." Absorption spectra have been determined for the hydrogen peroxide complexes of titanium and vanadium in the presence of 1 grm. of iron, in perchloric-phosphoric acid solution. These spectra furnish the basis for improved rapid, accurate methods for the determination of from 0.5 to 6 mg. of titanium in iron, steel, vanadium steel, and stainless steel, without separating the titanium or using hydrofluoric acid; accuracy approaching one part per hundred may be obtained. Details are given for a method of determining metallic and combined titanium in steel, which has given good reproducibility.

BRUCE PEEBLES & COMPANY, LIMITED, manufacturing electrical engineers, announce that their works will be closed from the evening of June 28 until July 8 for the Edinburgh trades holiday.

COMPOSITE MOULDS

By "TRAMP"

The production of castings in dry or greensand moulds depends largely on the foundry undertaking the work. Some shops specialise in greensand castings, while with others, dry are important work. V-belt pulleys and similar castings, when made in greensand, have a tendency to be bad on the back, or top face as cast. While stove capacity is not always available, and greensand moulding offers many advantages, *e.g.*, moulds are cast on the same day as made, and thus boxes are not tied up unduly; all are factors in favour of this system. Drysand, however, while superior, ties boxes up for a period while drying takes place. A compromise has been made in some instances for castings, as in Fig. 1, the procedure being as follows:

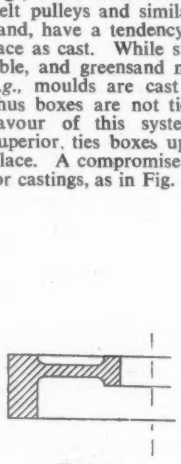


FIG. 1.

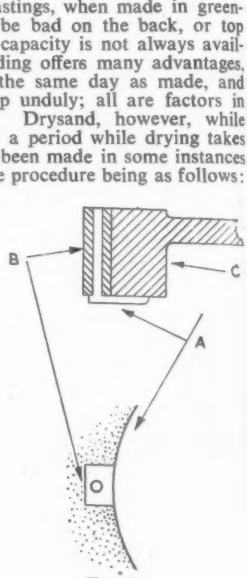


FIG 2.

A number of tops are rammed on a machine before leaving work at night and stoved. The next morning, these are pulled out early and allowed to cool, and a number of bottoms rammed in greensand, cored, and the tops placed on. Care has to be exercised that these tops are cold, because if they were placed on while warm, "streaming" of the mould would take place, with consequent "blowing" of the mould on casting.

The position of the runner varies for greensand and drysand castings. A drysand mould is stronger, and can withstand the wash of the metal better; consequently, the best place for a runner is on the centre. In greensand, however, a similar runner would create a tendency for the plate of metal to "scab," as all the metal in the mould has to pass over it. To counteract this, a print for a block core can be placed against the outside of the pattern so as to run the job in the bottom (Fig. 2), when A is the bottom runner, B the core forming the down gate, and C the wheel.

E. & B. ENGINEERING COMPANY, LIMITED, is being wound up voluntarily. Mr. R. H. Jenkins, 61-63, St. Paul's Churchyard, London, E.C.4, is the liquidator.

ELEVATING TRUCKS IN THE FOUNDRY

By R. S. TURNER

Efficient transport of material from one place to another is essential in the well-run foundry and the methods used to attain this vary according to the particular conditions that apply. The wheelbarrow in the jobbing foundry is one extreme, while for the other, there are the conveyors and elevators of the highly mechanised foundries, but the majority of foundries fall between these two extremes and this article describes how a foundry in this category solved its internal transport problems, with the use of elevating trucks and various types of stillages.

There are a number of makes of elevating trucks and these are fully described in manufacturers' catalogues, but a brief description of the particular one used in this foundry will be helpful at this point.

FIG. 1.—SKIP STILLAGE USED FOR SAND AND METAL.

The Truck

The truck is driven by a 600 c.c. air cooled petrol engine which also operates the hydraulic elevating mechanism and will handle a load of 25 cwt. at a speed of eight miles per hour. The single driving wheel is at the front and can be turned in any direction so that for reversing the driving wheel is turned 180 deg. from the forward position. The elevating platform is 5 ft. 6 in. x 2 ft. 8 in., and in the lowered position is 10 in. from the floor. The legs of the stillage are 12 in. long, so that the truck platform can be easily run under the stillage and elevated to a height of 14 in. from the floor, thereby picking up the stillage. The stillages are 3 ft. 3 in. wide, and because of the manœuvrability of the truck it is only necessary to have gangways a little wider than this.

All the gangways in the foundry being described are concrete; in addition, as many of the castings made are small and medium size machine-moulded parts, all the floors, with the exception of two bays for jobbing work, are concrete. In these two bays there are overhead travelling cranes which handle material from the trucks on the gangways.

Sand

All the moulding sand is reconditioned and mixed with a plant consisting of a rotary riddle, magnetic separator and mixing mill with the necessary elevators and storage hoppers and the transport of the sand to and from the moulding floors is done very efficiently with the elevating trucks. The stillage used (shown in Fig. 1) consists of a framework to suit the truck on which is fitted the skip which can be tipped up on either side for the machine-moulding bays, or lifted clear by the overhead cranes in the general bays. The cycle of operations is as follows:—

Moulds are knocked out on the moulding floors and the sand loaded into skips which are picked up by the truck, run to the sand plant and tipped through a grid in the floor. From here it is cleaned and fed into a storage hopper over the mill loading bucket. When required it is milled and discharged direct into a skip which the truck carries to the moulding floor where it is tipped in the required position. The only point where a shovel is used is the loading of the skips after knocking out the boxes—various methods are being considered with the object of cutting out this.

It will be seen that all the sand can be mixed at a central point under laboratory control without heavy capital or running cost on equipment for the moving of the sand. The skip stillages will hold approximately 15 cwt. of sand and are shown in Figs. 2 and 3, loading under the mill and tipping on a moulding floor.

Castings

Machine-moulded and all castings that can be handled by labourers are loaded on to stillages as they are knocked out on the moulding floors, then transported to the fettling shop where they are checked on to the sandblast. For this and subsequent operations, *i.e.*, grinding, fettling and inspection, the operator picks up a component, carries out the necessary work, and places it onto another stillage. Needless to say the stillages are kept conveniently close to the operators and after each operation are transported by the truck to the next operation except where two operations are done next to each other. After inspection the loaded stillages are run to the casting stores and an empty stillage brought back so that castings pass from moulding floors to stores with a minimum of man-handling. Standard stillages, as shown in Fig. 4, are used.

Elevating Trucks in the Foundry

Scrap Metal

Gates and runners are knocked off on the moulding floors and loaded into similar skips as used for sand. In the same manner, scrap and spare metal from the fettling shop and spare metal moulds are transported to the storage bins where scrap can be tipped. At the present moment this metal cannot be deposited on the charging platform with one handling, as the hoist is not large enough to take a truck, but plans are being made for a larger hoist. It will then be possible to take scrap and spare metal direct to the most convenient position on the cupola stage, at the same time considerably reducing the cost of transporting raw materials from the stock yard to the cupola stage.

Moulds

Large numbers of air-cooled engine castings are made which necessitate the drying of many small moulds, and the elevating trucks have proved very effective in reducing the transport costs of these moulds to and from the stores. A special stillage (shown in Fig. 5) was designed to accommodate about one ton of moulds and which conveniently fitted the gas-fired drying stoves. A number of these stillages are used, one being placed by each moulding machine producing this type of casting so that moulds can be placed on as they are made while others are in the stoves. When the moulds are dried the stillage can be quickly removed from the stove and another load put in with a minimum loss of heat. Larger moulds and cores are also handled with the trucks between the two general bays and the possibilities are being investigated of transporting the large number of small cores from coreshop to machine bay by stillage and truck.

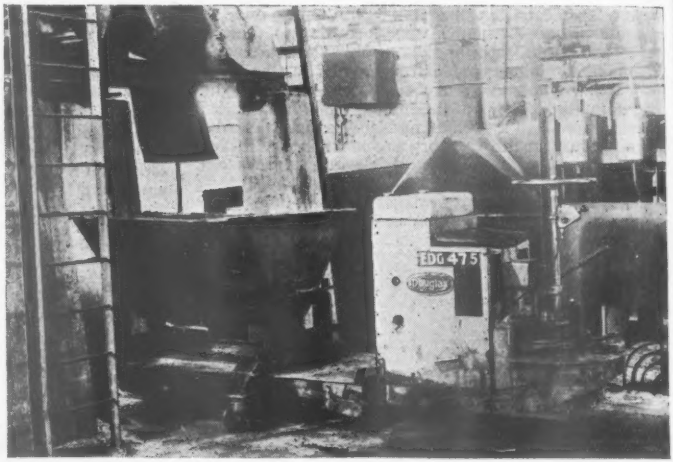


FIG. 2.—SKIP STILLAGE UNDER SANDMILL DISCHARGE.

FIG. 3.—TIPPING A LOAD OF SAND FOR A MOULDING MACHINE.

There are many other uses to which trucks are put such as the transfer of patterns to and from the pattern store, the movement of moulding boxes, and Fig. 6 shows the type of drop-bottomed bucket used for removal of rubbish. These buckets on a frame stillage, are placed by the truck at places where rubbish accumulates. The rubbish is then loaded into the buckets instead of lying on the floors until it can be removed. At pre-arranged times the lorry which is taking away the rubbish is brought into a crane bay to which the truck brings the loaded buckets. They are then hoisted by the crane over the lorry and the rubbish discharged by means

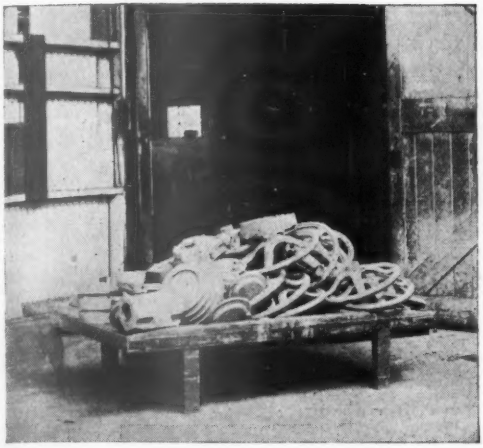


FIG. 4.—STILLAGE FOR CASTINGS.

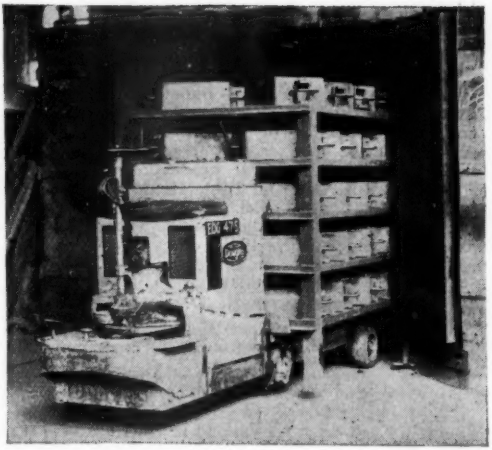


FIG. 5.—STILLAGE OF MOULDS BEING WITHDRAWN FROM STOVE.

of the drop-bottom doors direct into the lorry.

It will be seen that in addition to their present uses, plans are being made to use these trucks in any capacity where they will avoid man-handling of materials. A man with a truck can handle 25 cwt. more easily than 2 cwt. in a barrow, but a bigger advantage of the method of handling materials is the placing of stillages and skips in convenient positions so that operators or labourers can load direct, instead of castings or materials being put on the floor and requiring a further handling before being moved. The use of the elevating truck in the foundry has effected an appreciable reduction in labouring cost, in addition to which the shops are in a more tidy condition.

DAVID BROWN & SONS (HUDDERSFIELD), LIMITED, engineers, ironfounders, etc., envisage the creation in close proximity to the works of a private aerodrome for use of their officials for business travel.

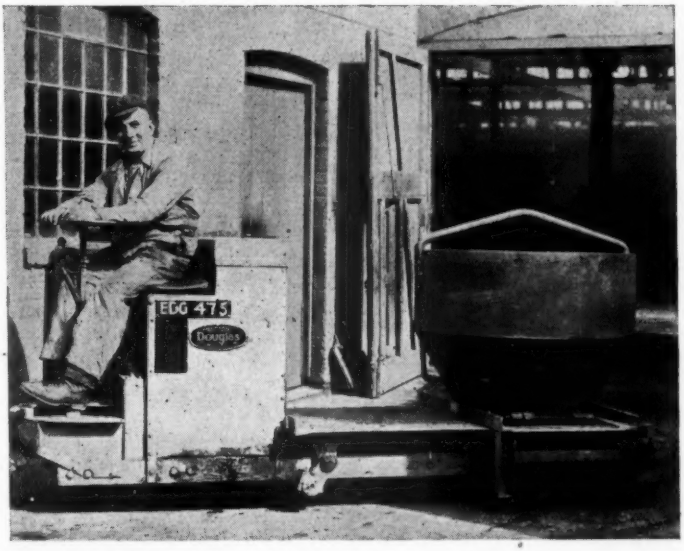


FIG. 6.—DROP-BOTTOM BUCKET USED FOR RUBBISH REMOVAL.

PIG-IRON AND STEEL PRODUCTION IN GREAT BRITAIN

The following particulars relating to pig-iron and steel production in Great Britain have been extracted from the Statistical Bulletin for May, 1946, issued by the British Iron and Steel Federation. Table I gives the production of pig-iron and ferro-alloys in April, with the number of furnaces in blast at the end of the month; Table II, production of steel ingots and castings in April and Table III deliveries of alloy and non-alloy finished steel. Table IV summarises the activities of the steel industry as a whole during the six months ended April, 1946.

TABLE I.—*Production of Pig-iron and Blast-furnace Ferro-alloys. (Thousands of Tons.)*

District.	Furnaces in Blast, 27.4.46	Weekly average production, April, 1946.					
		Hematite.	Basic.	Foundry.	Forge.	Ferro-alloys.	Total.
Derby, Leics., Notts, Northants and Essex	22	—	19.0	12.5	1.0	—	32.5
Lancs. (excl. N.W. Coast), Denbigh, Flints. and Ches. / Yorkshire (incl. Sheffield, excl. N.E. Coast)	7	—	6.1	—	—	1.5	7.6
Lincolnshire	13	—	19.7	—	—	—	19.7
North-East Coast	26	5.8	29.0	0.4	—	1.1	36.3
Scotland	10	0.6	9.6	2.0	—	—	12.2
Staffs., Shrops., Worcs. and Warwick	8	—	6.0	1.3	—	—	7.3
S. Wales and Monmouthshire	7	3.0	16.6	—	—	—	19.6
North-West Coast	7	12.7	—	0.1	—	0.7	13.5
Total	100	22.1	106.0	16.3	1.0	3.3	148.7
March, 1946	97	21.5	100.9	20.7	1.4	2.8	147.3
April, 1945	99	21.3	96.8	16.3	0.8	2.4	137.6

TABLE III.—*Deliveries of Alloy and Non-alloy Finished Steel. (Thousands of Tons.)*

Product.	Weekly average.				
	1944.	1945.	1945. April.	1946. March.	1946. April.
Heavy rails and sleepers	6.5	7.1	6.7	9.9	11.3
Heavy and medium plates	30.8	26.4	27.2	32.4	32.3
Plates—alloy	1.9	1.1	1.4	0.4	0.2
Other heavy steel products	38.2	33.1	42.0	32.8	30.6
Light rolled products (excl. wire rods and alloy steel bars)	46.2	41.9	42.1	50.8	46.1
Ferro-concrete bars	2.1	1.8	1.2	3.6	3.8
Cold-rolled strip (excl. alloy)	4.2	4.0	4.3	4.1	4.0
Bright steel bars (excl. alloy)	4.9	3.9	4.2	4.0	4.0
Sheets, coated and uncoated (excl. alloy)	21.2	20.2	22.6	23.4	20.6
Tin, terne and blackplate	10.0	9.5	10.1	11.2	9.6
Tubes, pipes and fittings	12.9	11.2	12.0	15.3	13.6
Steel wire (excl. alloy)	12.2	10.2	10.3	12.3	10.7
Alloy bars, sheets, strip and wire	5.6	3.0	3.2	2.8	2.5
Steel tyres, wheels and axles	2.6	2.5	2.3	3.4	3.3
Steel forgings-alloy	10.9	7.5	7.9	6.7	5.7
Steel castings	6.8	5.0	6.0	3.8	3.1
Total production*	217.0	188.4	203.5	216.9	201.4
Less Intra-industry conversion	24.5	17.8	18.4	16.3	16.8
Total	192.5	170.6	185.1	200.6	184.6
Add Deliveries of imported finished steel	5.0	1.0	2.9	—	—
Total deliveries of finished steel	197.5	171.6	188.0	200.6	184.6

* Includes finished steel produced in the U.K. from imported ingots and semi-finished steel.

TABLE II.—*Production of Steel Ingots and Castings. (Thousands of tons.)*

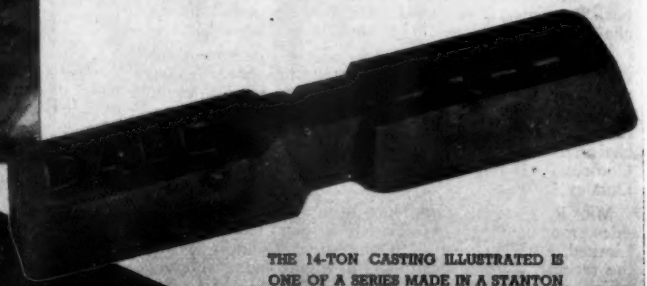
District.	Weekly average production, April, 1946.							
	Open-hearth.		Bessemer.	Electric.	All other.	Total.*		Total ingots and castings.
	Acid.	Basic.				Ingots.	Castings.	
Derby., Leics., Notts., Northants and Essex	—	—	(Basic) 9.6	1.1	0.2	10.6	0.3	10.9
Lancashire (excl. N.W. Coast), Denbigh, Flints. and Ches. / Yorkshire (excl. Sheffield and N.E. Coast)	0.4	18.0	—	0.3	0.3	18.3	0.7	19.0
Lincolnshire	—	24.7	—	—	0.1	24.6	0.2	24.8
North-East Coast	2.4	48.5	—	0.5	0.3	50.7	1.0	51.7
Scotland	5.9	32.4	—	0.4	0.5	38.1	1.1	39.2
Staffs., Shrops., Worcs. and Warwick	—	11.6	—	0.4	0.5	11.7	0.8	12.5
S. Wales and Monmouthshire	6.3	42.7	(Basic) 4.3	0.6	0.2	53.8	0.3	54.1
Sheffield	9.2	19.4	—	4.4	0.6	32.3	1.3	33.6
North-West Coast	0.1	2.5	(Acid) 3.7	—	—	6.2	0.1	6.3
Total	24.3	199.8	17.6	7.6	2.7	246.3	5.8	252.1
March, 1946	25.0	199.8	18.9	9.3	2.7	249.4	6.3	255.7
April, 1945	23.5	180.9	15.5	11.2	5.5	225.6	11.0	236.6

* Including alloy.

(*Continued on page 230*)

STANTON-DALE
REFINED PIG IRON

Manufactured to guaranteed analyses in seven standard grades. Also obtainable to individual specification



THE 14-TON CASTING ILLUSTRATED IS ONE OF A SERIES MADE IN A STANTON FOUNDRY FROM STANTON DALE IRON

1. Core being lowered into mould
2. Pouring the metal
3. Finished casting in transit

The
STANTON IRONWORKS
COMPANY LIMITED
NEAR NOTTINGHAM

PERSONAL

MR. S. H. L. GREAVES has been appointed managing director of Textile Machinery Makers, Limited.

MR. T. W. COOPER, general sales manager of Qualcast, Limited, light repetition steel and iron founders, etc., of Derby, has been appointed to the board as sales director.

MR. HENRY HUME SAUNDERS and BRIG. JAMES STORAR have been elected directors of Vulcan Foundry, Limited. Mr. Saunders has been appointed joint managing director as from July 1.

SIR MAURICE EDWARD DENNY, chairman of Wm. Denny & Bros., Limited, shipbuilders and engineers, Dumbarton, and lately president of the Air Registration Board, received the K.B.E. in the Birthday Honours List.

MR. E. C. WHITE has relinquished the position of managing director of Crosthwaite Furnaces & Scriven Machine Tools, Limited, Leeds. MR. W. KELLY has been appointed in his stead. Mr. White becomes deputy chairman and will act in a consultative capacity.

MR. LESLIE GAMAGE, joint managing director of the General Electric Company, Limited, has been elected chairman of the Council of the British Export Trade Research Organisation for the ensuing year. He is succeeded as deputy chairman by MR. C. PERCY LISTER, chairman and managing director of R. A. Lister & Company, Limited, engineers and ironfounders, of Dursley, Glos.

MR. R. CALVERT-LINK has been appointed general sales manager for Associated British Oil Engines, Limited, Duke's Court, 32, Duke Street, London, S.W.1, the recently formed group of oil-engine manufacturers which embodies Petters, Limited, J. & H. McLaren, Limited, Mirrlees, Bickerton & Day, Limited, Cub Oil Engines, Limited, Atlantic Engine Company, Limited, and Fielding & Platt, Limited.

MR. H. J. SMITH has resigned his position as chief engineer and technical director of Ether, Limited, Birmingham, and has formed the Industrial Pyrometer Company, with offices at 29, Vittoria Street, Birmingham, 1, in association with MR. H. BALLINGER, formerly laboratory superintendent of Ether, Limited. The new company will specialise in the manufacture of indicators and thermocouples for foundries and heat-treatment furnaces.

MR. MONTAGUE BURNINGHAM, chairman and managing director of Keith Blackman, Limited, ventilating engineers, manufacturers of gas-heating apparatus, etc., of Tottenham, London, N.17, has completed 50 years' service with the company. To mark the occasion the directors, staff and workers presented Mr. Burningham with a television set and an illuminated address on parchment, the presentation being made by Mr. G. F. Herron, who has been a director of the company for 45 years.

MR. A. T. MARSHALL and MR. DENIS REBBECK have been appointed directors of Harland & Wolff, Limited. Mr. Marshall became assistant secretary of the company in 1920, subsequently succeeding Mr. John Philp as secretary in 1937. He will continue to hold the office of secretary of the company. He is also on the board of the Iron Trades Employers' Association. Mr. Rebbeck, the elder son of Sir Frederick Rebbeck, chairman and managing director of the company, is a member of the executive staff.

LT.-COL. H. W. WOODALL is retiring from the position of managing director of Parkinson & Cowan, Limited, which controls companies manufacturing meters, gas appliances, etc., as from June 30, but is willing to continue as chairman. MR. H. P. BARKER, deputy managing director, will become managing director. The deputy chairman, MR. W. W. PARKINSON, is retiring after 57 years' service. SIR HAROLD SNAGGE has also decided to resign his directorship. MR. A. J. WEST, having devoted 50 years to the service of the company, is anxious to retire from the board, but has agreed to continue pending the appointment of a successor.

Wills

M'INTYRE, GEORGE, iron merchant, of Aberdeen... ... £23,095

SIMPSON, ROBERT, retired ironfounder, of Hurlford, Ayrshire £5,784

NOBLE, Sir William, of Leamington Spa, a director of of the General Electric Company, Limited ... £47,512

PARKINSON, FRANK, of Sunninghill, chairman and joint managing director of Crompton Parkinson, Limited, and associated companies. £1,497,285

PIG-IRON AND STEEL PRODUCTION IN GREAT BRITAIN (*Continued from page 228*)

TABLE IV.—*General Summary of Pig-iron and Steel Industry.* (*Weekly average in thousands of tons.*)

Period.	Iron-ore output.	Imported ore consumed.	Output of pig-iron and ferro-alloys.	Scrap used.	Output of steel ingots and castings.	Deliveries of finished steel.	Steel stocks* held by producers, etc.
1944	297.6	46.8	129.5	141.7	233.5	197.5	2,171.0
1945	272.5	77.2	136.7	138.5	227.3	171.6	1,683.9
1945—November	249.0	104.4	150.0	147.3	246.9	179.4	1,212.5
December	231.4	100.4	145.5	131.9	221.5	164.2	1,189.7
1946—January	245.3	96.7	143.6	134.8	228.8	173.4	1,223.9
February	256.1	99.6	146.1	146.7	247.2	186.0	1,197.8
March	256.4	108.1	147.3	155.2†	255.7	200.6	1,173.9†
April	243.5	112.9	148.7	152.9	252.1	184.6	1,127.8

* Stocks at the beginning of the years and months shown. † Revised.

Electrically Operated

VENTILATING SHUTTERS

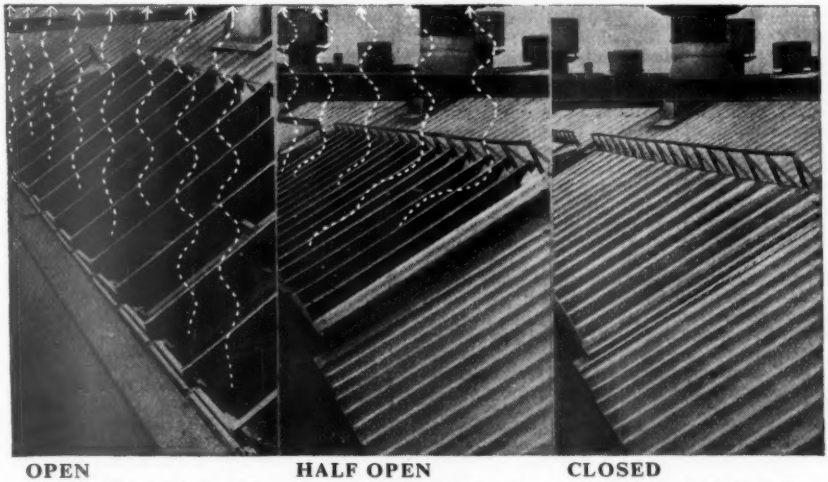
for instant clearance of

FUMES AND SMOKE

from Foundries, Retort Houses, Furnace Buildings, etc.

The Shutters provide what is in effect a moveable roof to the building which, by means of steel louvres in themselves forming extraction vanes, create extraction draught. The louvres are formed on both sides of a centrally operated dual gear unit; each side can be operated independently in order to facilitate extraction in strong winds.
In very wet weather, driving snow and at night they can be closed and form complete weather-tightness and light obscuration. **Adequate natural light to the workshops below is available when the shutters are open.**

BRITISH PATENT NOS. 536127, 536942 AND 536943



OPEN

When fully opened, the specially designed louvres provide an almost instantaneous clearance of fumes, smoke, etc., and, what is equally important, give adequate natural lighting to the workshops below.

HALF OPEN

It is often dangerous for rain to fall through the open roof of a workshop. In very light rain Hills Shutters can be partly closed and still permit a very high percentage of extraction.

CLOSED

In driving rain, sleet, etc., the Shutters can be closed down completely and they are then weather-tight.

HILLS

HILLS PATENT GLAZING COMPANY LIMITED

ALBION ROAD, WEST BROMWICH. 'PHONE : WEST BROMWICH 1025 (7 lines)

London Office : 125 HIGH HOLBORN, W.C.1. 'Phone : HOLborn 8005/6

M-W.54

SURPLUS WAR MATERIAL

MINISTRY OF SUPPLY DISPOSALS

It is estimated that surplus war material to the value of approximately £90,000,000 has already been disposed of by the Ministry of Supply, with further material still awaiting disposal. This was disclosed by Mr. Arthur Woodburn, M.P., Joint Parliamentary Secretary, Ministry of Supply, in London recently. The Royal Engineers Section are selling at the rate of £1,000,000 per month, and still have to dispose of some 630 cranes, 3,800 locomotives and wagons, 99,000 tons of bridging and trackway, 4,500 items of constructional plant, and over 20,000 generating sets, pumps, boilers, etc. Some £12,000,000 has been received for machine tools, with 30,000 more machines still available, mainly at fixed prices.

In addition to two permanent selling depots at Burghfield, near Reading, and at Thorp Arch, near Leeds, where machines are always on view and where sales can be completed on the spot, the Ministry will shortly open similar depots in the following places:—Elmdon, near Birmingham; Madeley, Staffs; Patrick Green, Woodlesford, near Leeds; Erith, near Dartford, Kent; Saltney Ferry, Cheshire; Blaydon-on-Tyne; Irvine, Ayrshire; Elstow, Beds; Featherstone Ordnance Factory, near Wolverhampton; Capenhurst, Cheshire; Yeadon, Middlesex; and Kidderminster. A scheme for the disposal of cutting tools and diamond dies and tools has been in operation for five months, stocks being disposed of by competitive tender.

Scrap metal figures reveal that during the past six months, breakdown of general stores has contributed 78,000 tons of ferrous and 3,000 tons of non-ferrous metals. The breakdown of warlike stores such as live ammunition has contributed 33,000 tons of ferrous and 22,000 tons of non-ferrous metal. The huge quantity of bombs and live ammunition will take 2½ to 3 years to be disposed of.

Articles such as testing machines, engineers' measuring equipment, gauges and fine measuring tools are inspected and segregated into types for distribution to manufacturers on a quota system based on current orders. Sales are arranged direct to universities and technical colleges. Items valued at £128,000 have been taken over, of which 38 per cent. have been redistributed. Regional officers are available to assist firms in connection with such matter as the preparation of lists of surpluses, and the speedy clearance of premises, while maintaining a watch on the position of disposals in their regions.

FROM PARIS the death is announced of M. Léon Guillet, the eminent metallurgist. He was a Membre de l'Institute de France and a past-Principal of the Ecole Centrale des Arts et Manufactures.

THE PARTNERSHIP between George Arthur Langton, Samuel Langton, and Samuel Langton, jun., carrying on business as brassfounders at Mersey Brass Works, Langton & Sons, has been dissolved by mutual consent. The business will be carried on in the future by George Arthur Langton and Samuel Langton, jun.

MAY PIG-IRON AND STEEL PRODUCTION

The table below shows pig-iron and steel production in the United Kingdom in May, 1946, with figures for earlier months for comparison.

Steel production was at the rate of 13,619,000 tons a year, compared with a rate of 10,962,000 tons in the same month of last year.

Pig-iron output increased further, the annual rate of May production being 7,860,000 tons a year, compared with 6,668,000 tons for May, 1945.

	Pig-iron.		Steel ingots and castings.	
	Weekly average.	Annual rate.	Weekly average.	Annual rate.
	Tons.	Tons.	Tons.	Tons.
1946—May	151,200	7,860,000	261,900	13,619,000
April ..	148,700	7,732,000	252,100	13,111,000
1st quarter ..	145,500	7,566,000	242,600	12,617,000
1945—May	128,200	6,668,000	210,800	10,962,000
April	137,600	7,154,000	236,600	12,302,000
1st quarter ..	134,500	6,992,000	233,200	12,126,000
1938—Year	130,000	6,761,100	200,000	10,397,900

INDUSTRIAL FILMS

Numerous films on industrial subjects have been produced, but not all are catalogued and some are difficult to trace. The need for a comprehensive catalogue is stressed by the Scientific Film Association, about films which would enable it to add to the list. of industrial films. A preliminary list containing 200 titles has been prepared and copies may be obtained from the Association at a charge of 2s. each.

The S.F.A. would be grateful for information about films which would enable it to add to the list. The title of the film, the source from which it may be hired or borrowed, and other relevant particulars, should be sent to the Hon. Secretary, Industrial Committee, Scientific Film Association, 34, Soho Square, London, W.1. The S.F.A. is a non-profit making body. Its aim is to promote the fullest possible use of the film for education and research in science and technology.

OBITUARY

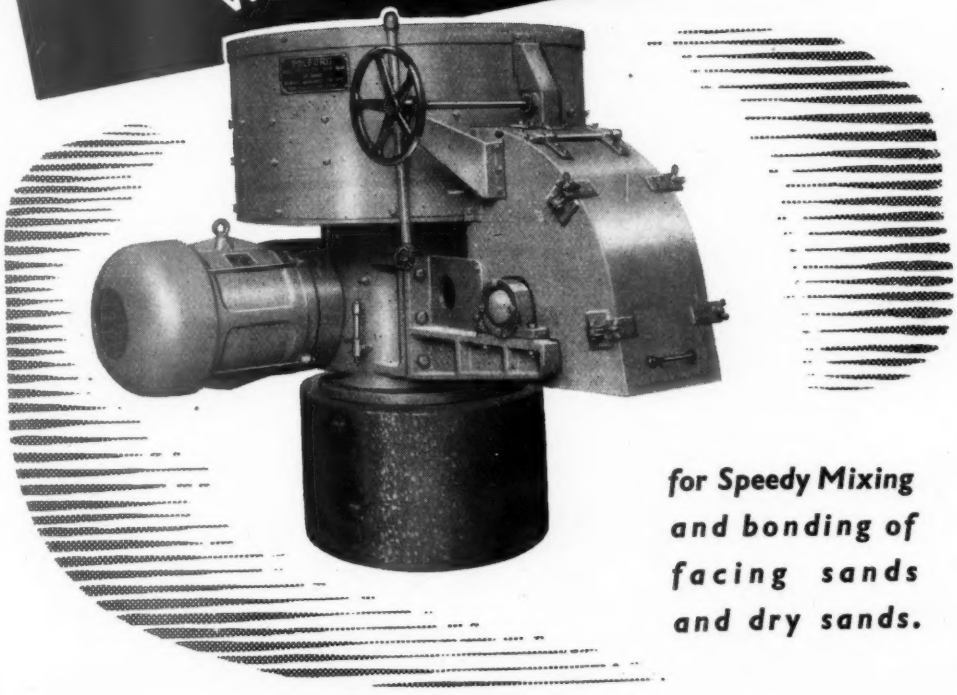
MR. WILLIAM MUSGROVE, for many years a director of G. & R. Thomas, Limited, Hatherton Blast Furnaces, Bloxwich, Staffs, has died at the age of 86.

MR. THURSTAN WILLIAM FAIRHURST, a director of Ruston & Hornsby, Limited, of Lincoln, and of Davey, Paxman & Company, Limited, of Colchester, died suddenly at Milwaukee, Wisconsin, U.S.A., on June 15.

MR. E. H. CAUSER, at one time Continental representative of F. Perkins, Limited, Diesel engine manufacturers, of Peterborough, and latterly with Peter Brotherhood, Limited, engineers and ironfounders, also of Peterborough, has died suddenly. He was 48.

PAT. Nº 570997

"POLFORD" REGISTERED
MOTOR DRIVEN MIXER MILLER
WITH DISINTEGRATOR



for Speedy Mixing and bonding of facing sands and dry sands.

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NEWS IN BRIEF

PLANS FOR THE alteration and extension of Hillside Foundry & Engineering Company (Cupar), Limited, have now been approved.

WHEN SIR W. DARLING asked the Minister of Supply in the House of Commons recently, which constituents of the Scottish Ironfounders Association it was his intention to nationalise, and why. Mr. Leonard, who replied, said that this question was premature and an answer could not, therefore, be given.

IN ORDER TO REPLACE the capital involved in the recent repayment of £27,100 debenture stock and to pursue the programme of works reconstruction, Horseley Bridge & Thomas Piggott, Limited, constructional engineers, ironfounders, etc., Tipton, Staffs, are offering 37,500 ordinary 10s. shares at 25s. 6d. a share to existing ordinary shareholders in the proportion of one new ordinary share for every 15 held on June 15. Permission to deal has been received.

RANSOMES & RAPIER, LIMITED, engineers, ironfounders, etc., of Ipswich, are increasing their authorised capital by £205,000, bringing the total amount of capital to £600,000. It is understood that the Capital Issues Committee have given the company permission to issue 212,000 10s. ordinary shares at 18s. 6d. The new shares will be offered to existing ordinary stockholders in the proportion of two new shares for each five 10s. units of ordinary stock now held.

HARRISONS & CROSFIELD, LIMITED, Eastern export merchants, and R. A. Lister & Company, Limited, engineers and ironfounders, of Dursley, Glos., have recently formed a subsidiary to handle the sale of their engineering products in Ceylon, Malaya, Dutch East Indies and Borneo. The new company, registered under the name of Harrisons Lister Engineering, Limited, will acquire, in those countries, all Harrisons & Crosfield's agencies which deal with that type of business.

THE GOVERNMENT'S DECISION to nationalise our basic industries was causing more anxiety to engineers today than any other factor in the industrial outlook, said Lord Davidson, president of the Engineering Industries Association, at a national meeting of members in London last week. They did not approach the issue from the angle of prejudice, for it was the practical results of nationalisation that must influence their industry for good or ill. If nationalisation remained the policy of the Government and they had the majority in Parliament to carry it through, their aim must be to mitigate those evils which could be proved to exist and where possible to suggest remedies. "My conviction is," added Lord Davidson, "that nationalisation will in the end fail."

MR. J. HAROLD BROWN, chairman of Sanderson Bros. & Newbould, Limited, the Sheffield tool and gear manufacturers, etc., in a statement circulated with the annual accounts of the company, says that as soon as the wartime barriers on export trade were removed, their orderbooks became inundated. In view of the tendency overseas towards the attainment of self-sufficiency which was in evidence in pre-war years, and had become so much more intensified when supplies could not be obtained from this country, it became necessary to devote special attention to the possibility of extending their production resources to meet such developments, and negotiations were now in hand to meet this situation. A new production department had now started operations in the manufacture of tungsten-carbide tools, Mr. Brown added.

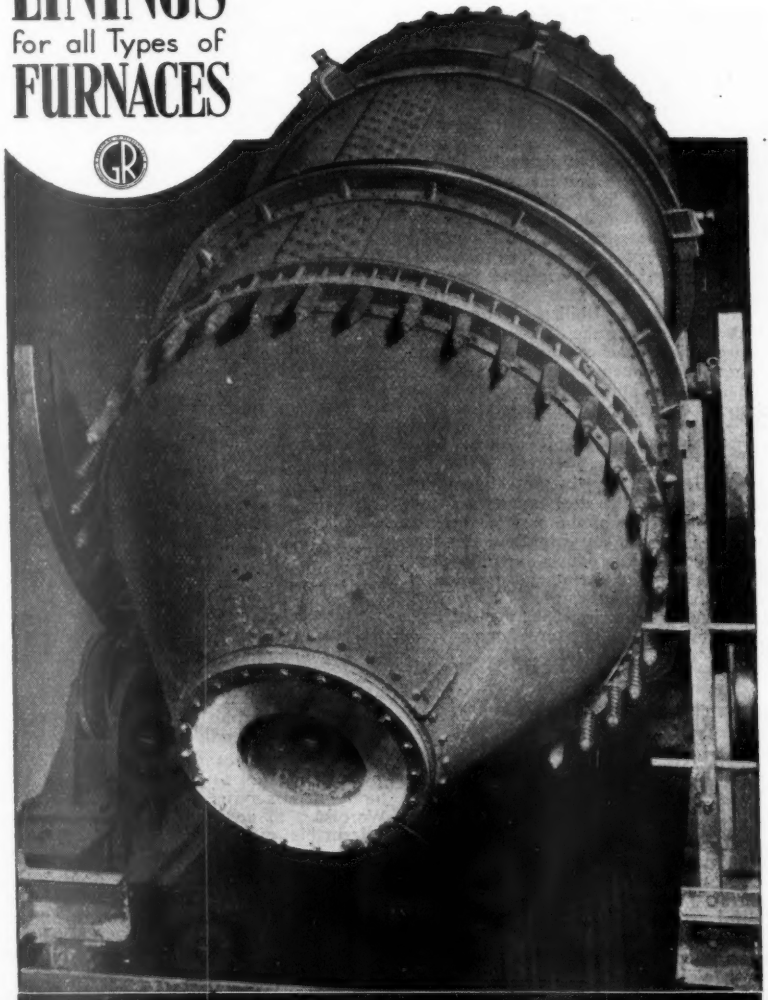
MR. OWEN GRAZEBROOK, presiding at the annual meeting of the British Rollmakers' Corporation, Limited, said the output of rolls from their foundries during the years of war exceeded that of any previous period; the equipment and machinery installed during the prewar years enabled them to supply not merely an increasing tonnage of rolls for the steel and allied trades, but also to meet a demand for new types of rolls for new metals and new technique. The special technical problems imposed by war demands had resulted in the development of new types and qualities of rolls, new methods of manufacture and new metallurgical knowledge, which had added usefully to their range of products. In the year under review they had made some progress in the renewal of their plants. In Scotland they had installed a modern acid open-hearth steel furnace capable of producing the largest cast-steel rolls. Mr. Grazebrook also stated that they had embarked on important extensions to the works.

BRITISH NON-FERROUS METALS FEDERATION

At the first annual general meeting of the British Non-Ferrous Metals Federation, which was formed in April, 1945, as the representative organisation of the industry, Mr. Horace W. Clarke (president) stated that a very helpful spirit of co-operation existed between Government departments and the Federation, which was, in his view, an example of the proper relation between the Government and industry, and for the mutual benefit of all parties. He stressed as an example co-operation in the field of surplus disposals. The industry, he said, had been very fortunate in being able to secure an orderly liquidation of existing surplus stocks of non-ferrous metals without any serious dislocation of the normal industrial programme.

Continuing, the president said one of the most important developments of the first year's work of the Federation had been the establishment of a statistics department, which had taken over from the Ministry of Supply responsibility for certain non-ferrous metals statistics. It was hoped that this work would shortly be extended in various directions. There could be no doubt that in modern conditions accurate and speedy statistical information was essential to the planning of industry. Before the war, non-ferrous metals statistics in this country had lagged a long way behind those of Germany and the United States of America. It was hoped that the Federation Statistics Department would increasingly fill this want and that, with the progress of time, its activities would embrace a wider field to the lasting benefit of all concerned.

LININGS
for all Types of
FURNACES



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173

Raw Material Markets

IRON AND STEEL

The lighting up of a new blast furnace in the Cleveland area has had no effect on the tonnage of pig-iron available for the market, since the whole of the output of the new unit is reserved for use in the associated steelworks. Regular deliveries are reaching the foundries, but distribution of high-phosphorus iron has to be carefully controlled to avoid shortages, and an all-round limitation of licences prevents any accumulation of pig-iron stocks at the foundries. Distribution of hematite, low- and medium-phosphorus and refined irons is on a less parsimonious scale, but for these also a better demand is developing as the tempo of operations in the general engineering and speciality foundries quickens.

The tonnages of sheets bars, billets, blooms, etc., supplied by British steelworks to the re-rolling industry, wire mills and forges have reached impressive proportions, but consumers' requirements have not been overtaken, and as there is no immediate prospect of an expansion of imports, which have shrunk almost to vanishing point, re-rollers are eager buyers of any defective material which the steelmakers can place at their disposal.

Apart from a sharp contraction in the shipment of rails, fishplates, sleepers, etc., the steel exports in April compare favourably with those of the previous month. Home requirements, however, are rapidly increasing over a wide range of steel products, notably steel plates and black and galvanised sheets, and it is doubtful if the recent export figures can be maintained without detriment to home industries. Sheet, plate, and section mills have substantial rolling programmes and in some cases delivery dates extend into 1947.

NON-FERROUS METALS

It is understood that negotiations for an improvement in the price paid by the Ministry of Supply for Malayan and Nigerian tin has been concluded. An announcement of the new prices is likely to be made shortly if agreement has in fact been reached.

U.S. crude copper production in May totalled 31,712 short tons, according to Copper Institute returns. This compares with 29,379 tons in April. Refined output was 20,551 tons, against 18,989 tons. Many American refineries continued to be handicapped by labour disputes.

Output of zinc in France last month was 3,000 metric tons. Production should shortly be stepped up, as additional furnaces are expected to be brought into commission in Northern France. It is estimated that output over the year may be in the region of 42,000 tons; this compares with a 1938 output of 61,000 tons.

The British Non-ferrous Metals Federation announces that the U.K. output of unalloyed copper products in May was 24,150 tons, of which castings and miscellaneous products accounted for 500 tons. Gross output of alloyed products was 27,160 tons, the copper content being 18,090 tons, the respective figures for castings and miscellaneous products being 5,870 tons and 4,700 tons.

CONTRACTS OPEN

Any date given is the latest on which tenders will be accepted. The address is that from which forms of tender may be obtained.

Coventry, July 23—Steel pipes and Johnson couplings, for the Corporation. Binnie, Deacon & Gourley, engineers, Artillery House, Artillery Row, Westminster, London, S.W.1. (Fee £5, returnable.)

Coventry, July 23—Cast-iron pipes and specials, for the Corporation. Binnie, Deacon & Gourley, engineers, Artillery House, Artillery Row, Westminster, London, S.W.1. (Fee £5, returnable.)

Newcastle-upon-Tyne—Drainage goods, rainwater goods, metal windows, etc., for the Housing Committee. The City Architect, 18, Cloth Market, Newcastle-upon-Tyne, 1.

Rothwell, July 10—Supply and laying of about 6,000 yds. of 6-in. water main, for the Urban District Council. Pick, Everard, Keay & Gimson, engineers, 6, Millstone Lane, Leicester. (Fee £1 1s., returnable.)

Sheffield, July 5—Pipework, tanks, valves, etc., for the Town Council. Mr. J. R. Struthers, general manager and engineer, Commercial Street, Sheffield, 1. (Fee £2 2s., returnable.)

THE INTERNATIONAL HARVESTER COMPANY OF GREAT BRITAIN, LIMITED, of Wheatley, Doncaster, are in process of equipping their foundry department.

THE COUNCIL of the Stock Exchange have granted permission to deal in £335,425 ordinary stock of Guest, Keen & Nettlefolds, Limited, such stock ranking for dividend from April 1, 1946.

THE COUNCIL of the London Stock Exchange has given permission to Heenan & Froude, Limited, structural manufacturing engineers and ironfounders, of Worcester, to deal in 200,000 4½ per cent. cumulative redeemable preference shares of £1 each, fully paid.

"WE HAVE BEEN ABLE to run our foundries on a five-day week and get better production than from five and a half days," said Sir Walter Preston (chairman) at the annual meeting of Platt Brothers (Holdings), Limited, Oldham. Regarding labour shortage, he said, the first bottleneck was in the foundry, but the foundries were now no longer the worst.

IN A STATEMENT accompanying the annual accounts of Parkinson & Cowan, Limited, the chairman and managing director, Lt.-Col. H. W. Woodall, announces that the company have sold their assets in Australia to receive in exchange a large shareholding in Electricity Meter & Allied Industries, Limited, one of the largest undertakings of its kind in the Commonwealth.